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CONTENTS

Frontispiece and Sketch—Lucius E. Sayre 1
Editorial:
A Message from the President of the American Pharmaceutical Association 5
Nineteen Thoughts for Nineteen Nineteen 6
Note on U. S. P. Assay for Oil of Peppermint—Lyons 10
Some Variations in Cinchona Bark and Its Preparations—Schaefer 11
Research and the United States Pharmacopoeia—Clark 13
Botanicals of the Blue Ridge—Ewing and Stanford 16
Couch Grass versus Bermuda Grass—Gathercoal 26
The Appearance of a Package and Its Contents as a Factor in Merchandizing—Nitardy 32
Repetition Makes Reputation—Figgis 35
Section on Historical Pharmacy, American Pharmaceutical Association—Minutes 38
Pharmacological Assaying—Hamilton 49
Proceedings of the Local Branches 65
Committee Reports 65
Council Business—Letters 7 and 8 67
Official Roster for 1918–1919 69
Editorial Notes:
The New Year 77
The Advisory Committee of the A. Ph. A. for soldier and sailor pharmacists 77
War History of Pharmacy 77
Sale of the Bayer Company 77
Skin Diseases from Lubricants Used by Metal Workers 77
Treatment of Venereal Diseases by the Government and State 78
The American Pharmaceutical Association and American Pharmacists Should Take a Deeper Interest in Research 78
Isotonic Coefficients 79
Egg Substitutes and So-called Egg Savers 79
Sanitary and Prophylactic Service in Brazil 80
New Chemical and Drug Manufacturers 80
The American Metric Association 80
The Pharmacist and the Law 81
Changes of Address 82
Journal Announcements 84
Advertising—Cover Pages 2, 3 and 4 and Pages I to XII.

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THE SIXTY-SEVENTH ANNUAL CONVENTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN NEW YORK CITY, DATE TO BE NAMED.

The American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy will also meet in New York City in 1919.

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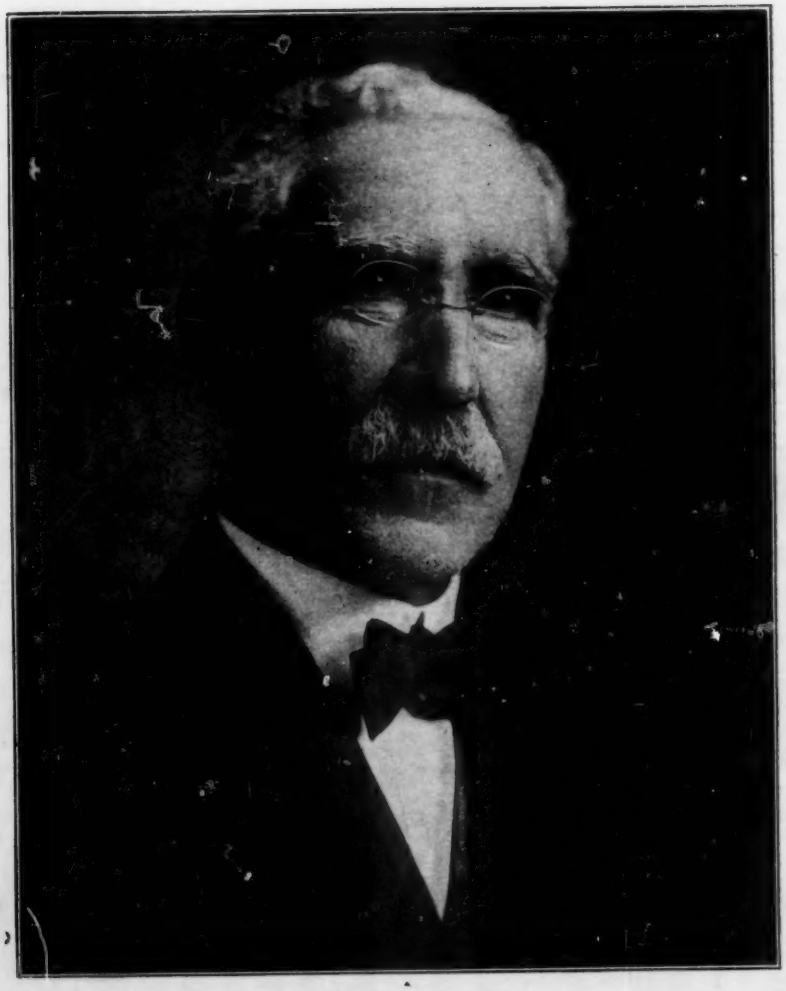
LAWRENCE, KANS.

President-Elect American Pharmaceutical Association



L. E. SAYRE

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. VIII JANUARY, 1919 NO. 1

LUCIUS ELMER SAYRE.

L. E. Sayre, president-elect of the American Pharmaceutical Association, was born at Bridgeton, N. J., seventy-one years ago. Here he received his early education and also served for a time in the drug store of Robeson & Whitaker. In an article contributed to the Section on Historical Pharmacy, A. Ph. A., Professor Sayre interestingly related the experiences of an apprentice of the early Sixties in New Jersey.[1] Ambitious to learn more of the many things he had become acquainted with and to acquire a scientific knowledge of pharmacy, he decided to attend the Philadelphia College of Pharmacy, and like most pharmacy students of that period engaged as clerk in a drug store,—that of Dr. L. Updyche, at 12th and Fairmount Ave. After graduation from the College in 1866 he was employed in the laboratory of Frederick Brown, at 5th and Chestnut Streets. Succeeding this period he was engaged by Henry C. Blair's Sons as chief clerk, and served in this capacity for ten years, when he enlisted in the drug business for himself at 18th and Market Streets, forming a partnership with his friend and classmate, the late Prof. Joseph P. Remington. During these years he also was lecturer in Pharmacy at the Women's Medical College and quiz-master in Materia Medica at the Philadelphia College of Pharmacy.

In 1885 the Kansas Legislature passed an Act creating the School of Pharmacy, thereafter located at the State University; the Board of Regents elected the subject of this incomplete sketch dean of the School and professor of Materia Medica and of Pharmacy. At present Professor Sayre devotes his time to the former subject and administrative work, as dean. The School of Pharmacy was given a home in the Chemistry and Pharmacy building in 1899. Since the school was founded over two thousand students have matriculated and about five hundred have been graduated as pharmacists. In 1907 Professor Sayre was elected director of drug analysis for the Kansas State Board of Health and he is also member of the botanical staff of the Kansas State Board of Agriculture. As an author he is best known by his contributions to pharmaceutical publications, proceedings

[1] JOURNAL A. PH. A., 6, 454.

of State and National associations and his text-book on Organic Materia Medica and Pharmacognosy. He has been a member of the last three Revision Committees of the U. S. Pharmacopoeia. He received the degree of Master in Pharmacy from the Philadelphia College of Pharmacy, and the University of Michigan honored him with the degree of Bachelor of Science in 1896.

The president-elect joined the American Pharmaceutical Association in 1883, and has served on important committees, among these that on Drug Reform. He was chairman of the Scientific Section in 1893, secretary of the Section on Historical Pharmacy in 1917, and its chairman at the recent Chicago meeting.

The Proceedings of the American Pharmaceutical Association and the pages of the JOURNAL of the A. Ph. A. have reported the contributions of this enthusiastic worker in pharmacy. The subjects are various and relate to teaching in its various phases, historical, theoretical and practical pharmacy, organic chemistry, botany and pharmacognosy. All of these contributions evidence the earnestness of a careful and thorough student and, as the subjects have relative value, it may not be presumption on the part of the writer to make special reference to his work on Gelsemium which was presented in papers to the Scientific Section from 1905 to 1915.

As heretofore indicated, no attempt is made in this writing to present a complete sketch, realizing that the members are well acquainted with the labors of the man whom they have been pleased to honor with the presidency of the American Pharmaceutical Association for 1920–1921.

Professor and Mrs. Sayre, nee Miss Ellen Platt, were married in 1874; the former has missed but very few of the annual conventions since his affiliation, and the latter is a frequent visitor. They have two sons and two daughters, all of whom have their own family circles. A number of years ago the Sayres selected a summer residence in Douglas, Mich., and very soon after the annual school term is completed this is home for them. E. G. E.

AN ACKNOWLEDGMENT OF THE HONOR CONFERRED BY THE A. PH. A., FROM THE PRESIDENT-ELECT.

To the Members of the American Pharmaceutical Association:

I was surprised and gratified to receive the notice of my election to the presidency of the American Pharmaceutical Association. I wish to assure the members of the Association that it gives me much pleasure to receive this high honor, and welcome it not only as an expression of their confidence but also as an added responsibility; not without misgivings, however.

During the present year President Charles H. LaWall has the care of the Association, and never before has this body been so much in the public eye. A consciousness of this fact and that there will be many post-war problems to face, brings the realization to me that I will need not only the present incumbent's aid but that of all the members of this Association, when I assume the duties of office. (Signed)

L. E. SAYRE.

EDITORIAL

E. G. EBERLE, Editor 253 Bourse Bldg., PHILADELPHIA

A MESSAGE FROM THE PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

To the Members of the American Pharmaceutical Association, Greetings:

AFTER four years of stress and turmoil, the peace for which the world has been longing is in sight at last and our eyes are filled with tears of rejoicing and our hearts with gladness of thanksgiving as a realization of our hopes seems imminent.

This is a time, not only for rejoicing and thanksgiving but a time for us all to pause and reflect and with new and heightened resolution, to press on toward the future. Whether our definitions and interpretations of Pharmacy are the same or not; whether orientation is necessary for some of us or whether we have our faces turned toward the highest goal, we should all be imbued with the spirit of broadmindedness and tolerance exemplified by the immortal phrase "In proportion as we love truth more and victory less, we should endeavor to place ourselves in such a position as will enable us to understand why our opponents think as they do."

All jealousy, pique and petty feelings of revenge should be relegated to the *Capharnaum* or lumber room of time and all should join in renewed endeavor to aid pharmacy in this period of evolutionary change through which it is now passing. When we look back over the roll of presidents of our Association who have passed on, some stand out with more distinctiveness than others. Like Abou ben Adhem, some have been distinguished by their love for their fellow men and the welfare of their chosen profession. Among these are the names of Procter, Parrish, Ebert, Diehl, Remington, Dohme, Prescott, Eliel, Searby, Oldberg and Holzhauer, quoting them in the chronological order in which they served. There are others, too, while never attaining to the presidency, left their impress upon their profession for all time to come—Maisch, Hallberg, Squibb, Rice and Caspari. Let us take counsel of the records and examples of these, our great predecessors.

The war has been won, but not without the aid of pharmacists, whose unrewarded services will constitute a mark of distinction in the future for those who gave so freely of their skill and knowledge to make the army fit and capable "to make the world safe for democracy."

Pharmacy, which has given generously both men and materials, will have fewer problems to solve in the reconstruction period than some of the other professions, for there is a place waiting for each one who returns, and though we have

failed in our efforts to obtain proper recognition of Pharmacy at this time, we have made progress, and the glory to pharmacists is all the greater for having served so nobly without recognition in rank.

Now the time has come to face the problems of the future. Let us do so with optimism, and faith in each other's motives. Let us encourage and approve movements leading toward coördination and coöperation and discourage the fortissimo rendition of the anvil chorus. Criticism is easy and is a tempting highway to fame. Pessimism is a potential poison to the "body pharmaceutic." Let us all strive during the coming year to make such noteworthy progress that eventually, instead of having to go out into the highways and byways to seek members, we can pick and choose from a waiting list.

We must not wait, however, for this condition to come to pass by some miraculous means. We each have our obligations to ourselves and our profession. To ourselves first, that we may develop worthy ideals and then be true to them; to our profession, that we may strive unselfishly and sincerely to so promote its progress that we shall attract to its ranks all those worthy of membership. Pharmacy is not decadent. Membership in the American Pharmaceutical Association is an honor which should be sought for. Let us "dream and not make dreams our master;" let us "think and not make thoughts our aim."

A new and glorious day is dawning for pharmacy, in which recognition of the worthy plans for federation, accomplishment of research, and many other dreams of the present will be translated into action and fruition. May our Association during the coming year go onward and upward to a realization of achievements worthy and lasting!

CHARLES H. LAWALL, *President.*

NINETEEN THOUGHTS FOR NINETEEN NINETEEN.

NATIONS and industries are being brought together. The votaries of pharmacy, medicine and chemistry should work together: their interests are largely common interests, they are related—often the work of one branch is incomplete without the other—the fullest measure of prosperity is possible for each when all recognize their common interests for the welfare of those they serve.

The people have a right to demand a service from the united endeavor of pharmacy, medicine and chemistry. Professions and industries are useful to the world in proportion to the attainments of the votaries.

Diseases are man-made and the public should be impressed with this important fact. The purpose of industries and professions related to medicine is to advance social as well as material well-being; therefore, the community is entitled to consideration from this service, which is best promoted by coöperation.

Individuals are entitled to a safeguard of their health as much as of their property. Diseases are man-made, but they cannot always be avoided because of the ignorance or indifference of the disease germ producers and carriers. The community should have the counsel of those who lay claims to a knowledge of these subjects. Medicine, chemistry and pharmacy have joint responsibilities in this connection; coöperative work in research is incumbent upon the votaries.

"The war has demonstrated that through industrial coöperation great economies may be achieved, waste eliminated and efficiency increased." Professions should capitalize on these lessons by adopting similar practices whereby related professions encourage reasonable coöperation. It is in the public interest, and special privileges are granted because of the valuable service rendered by the professions. An attitude which hinders in giving the best service is not just to the public.

"Men of business may not be regarded competent advisers in matters of diplomacy and statecraft as affecting reconstruction, but, as a corollary to this assumption, the diplomat or statesman may not be regarded as a wholly competent adviser in matters of economic reconstruction." The deduction is that men of different professions may work together, but each class is best qualified to render service in the department for which the individuals have been trained by experience and education. It constitutes the best service for the public and therein is the duty.

The discoveries of Scheele not only made possible the chemical industries but also the successful treatment of the sick, diseased and wounded. Labarraque conveyed a suggestion to Carrel and Dakin. The horrible fate of the abandoned and helpless and wounded in No Man's Land would have been the lot of all the injured if it had not been for the foundations of the germ theory laid by Pasteur. There is opportunity and glory enough for all; the greatest service is given humanity by the working together of related industries and professions.

Underlying professional attainments there must be adequate education. The individual needs not only experience but a knowledge which enables him to understand what he sees and does. There is military rank and there are degrees of education and learning, and in both there are specialists; qualifications along certain lines do not essentially qualify individuals in those with which they are not familiar. Some of the medical and perhaps also some pharmacy schools have come to the conclusion that military training and professional education are not compatible.

There should be morale in professions and among professions. A definition given for the word is "belief in one another." In that sense it means that the votaries of the same profession believe in each other, and to carry the thought further: those who are engaged in related professions believe that coöperatively

they can and will do better work. It was the force that put our boys over the top: they not only believed but they made good their belief. It carries the spirit of sacrifice and altruism; it evidences the willingness to give a lift; it means the gladness to be of service, rejoicing in the success and advancement of others. It is applied serviceable friendship of those coöperating, and for those served,—the public.

"Common danger, common toil and common suffering have developed the spirit of brotherhood as nothing else could do." This engendered spirit presents the hope for the future development of our industries. It means also that the value of human life and health is above class distinction and material gain; it is the application of the Golden Rule in genuine service.

Every profession, industry and business has become established because the public has need for it; the votaries, if they render valuable service, are entitled to the opportunities for earning their living and under conditions which will not only make them desirable citizens but enable them to render service that warrants compensation and develops in them a higher appreciation of their vocation and of its greater possibilities.

Industry, efficiency and initiative should be encouraged and rewarded; indifference and hindrance to best service should be discountenanced. Individual and coöperative research is essential to development, and to withhold support or otherwise hinder with selfish motives or for selfish reasons is little less than disloyalty.

The public has a right to expect and investigate the coöperation of industries and professions, and to determine whether they are giving it the best service and protection possible. There is a widening field of medical science before us in which medicine, chemistry and the departments of special and direct concern to pharmacists should find much to do. Research and development are partners. The public is the beneficiary.

The most potent measure in bringing about an understanding of the mission of professions is reasonable, rational discussion, with the purpose of devising the best means for being of service to the public. The mote and the beam too often interfere with vision. The relation between the American Pharmaceutical Association and the American Medical Association should be such that members of the latter place utmost confidence in those of the former, and reversely. This creates public confidence in the individuals, in the practice of medicine and of pharmacy—it benefits the public.

The Government should assist the industries and business by counsel and cooperation; very commendable work has already been done and more is contemplated. There is also a duty to the professions, and pharmacy has not received deserved recognition. If pharmacy is an "essential service," then the individuals should be placed in position to render the best possible service.

The application of right principles is essential to effect right relations: "the letter killeth and the spirit maketh alive." The attitude and spirit are all-important. Ruskin said: "In the world's affairs there is no design so great or good but it will take twenty wise men to help it forward a few inches; and a single fool can stop it."

The individual or the profession renders the greatest service that coöperates to give the largest number the greatest opportunity for development, contributing the best service to humanity and thereby adding to the wealth and health of civilization.

The American Pharmaceutical Association should be so generally and favorably known that it gives the members a standing in the community as peers of their profession. The same applies relatively to State associations. We judge others from our own viewpoints. Membership in an association should mark the member as one who is associated with the best men in his profession, engaged in efforts to raise the standard of his calling and make it more deserving of public confidence.

Association membership gives pharmacists a higher appreciation of their profession and also of those likewise engaged, and of those in related work—an inspiration to promote pharmacy and contend for its rightful recognition. We have both individual and collective responsibilities,—now as never before should the spirit of the Golden Rule be generally applied. E. G. E.

MEETING OF THE NATIONAL DRUG TRADE CONFERENCE.

The National Drug Trade Conference met in Baltimore, January 7. Among the actions taken by the Conference was the adoption of an amendment to such alcohol legislation as may be introduced into the various State Legislatures:

"Provided that nothing in this act shall prevent the manufacture and sale of such preparations as flavoring extracts, essences, tinctures, perfumes, or remedies containing drugs or medicines which do not contain more alcohol than is necessary for legitimate purposes of extraction, solution, or preservation, and which contain drugs in sufficient quantity to medicate such compounds and which are sold for legitimate and lawful purposes and not as beverages."

The aim of this amendment is to relieve the Drug Trade of the annoyances occasioned by the varying construction under prohibition laws with respect to alcoholic medicinal preparations by the addition of a uniform definition of intoxicating liquors.

The officers for the ensuing year are as follows: President, Dr. James H. Beal, Urbana, Ill.; vice-president, Samuel C. Henry, Philadelphia; secretary-treasurer, Charles M. Woodruff, Detroit, Mich. Executive committee: George W. Lattimer, Columbus, O.; James F. Finneran, Boston, Mass.; Dr. W. C. Abbott, Chicago; Harry E. Thompson, Washington; and H. Lionel Meredith, Hagerstown, Md.; the president and secretary-treasurer are *ex-officio* members.

NOTE ON U. S. P. ASSAY FOR OIL OF PEPPERMINT.

BY A. B. LYONS.

The requirement of the U. S. P. for Oil of Peppermint is that it shall contain "not less than 5 percent of esters calculated as menthyl acetate and not less than 50 percent of total menthol, free and as esters." The assay for esters is sound, being made by the saponification process. The effect of saponification upon the oil is to increase its weight by 26 percent of the weight of menthyl acetate present. It is not a matter of serious consequence that the ester actually present does not consist wholly of menthyl acetate. For the purposes of such an assay the difference is quite negligible.

For the second determination an indefinite quantity (10 mils) of the oil is acetylized in the usual manner, washed and dried. Of this oil, containing the whole of the menthol in the form of menthyl acetate, a weighed portion is taken for saponification. The result of titration shows how much half-normal alkali is required to neutralize the acetic acid which exists in combination with menthyl, each mil of the standard alkali corresponding with 0.07808 Gm. of menthol or 0.09909 Gm. of menthyl acetate. The difference between these represents the difference in weight due to acetylization, *viz.*, 0.02101 Gm.

The formula given in the U. S. P. for calculating the result of this assay introduces this factor (0.021), but applies it to the whole of the menthol, making the weight of the oil taken = B — (A × 0.021), B being the weight of the acetylized oil taken and A the number of mils of volumetric (half-normal) alkali consumed in neutralizing the acid of acetylization, including that of the esters originally present. This formula will give the percentage of the oil after saponification of the esters naturally present—not that of the original sample. To find the true percent we must refer to the first step in the assay, which determines the percent of esters originally present in the oil—or by substituting for 9.909 the factor 7.808, the percent of menthol corresponding to those esters. We must therefore deduct from the (A × 0.021) of the formula a compensating correction, which in case of an oil containing about 50 percent of total menthol will make the expression (A — C ÷ 2.5) × 0.021. The compensating quantity will, however, vary with the percent of total menthol, so that this would serve only as an empirical formula, by which, however, we could determine with certainty whether or not a given sample contained "not less than 50 percent of total menthol." The amended formula would read:

$$\text{Percentage of total menthol} = \frac{A \times 7.808}{B - (A - C \div 2.5) \times 0.021}$$

If the percent of menthol differs materially from that of the pharmacopoeial standard the formula may be amended by substituting for the divisor 2.5 the expression 2 + M, in which M stands for the percent of total menthol in the sample by U. S. P. formula. The result reached is a trifle less than the correct figure, but the difference is negligible.

The following is a general formula which will seem simpler, and will give a

close approximation to the truth in samples containing a proportion of menthol not varying greatly from the pharmacopoeial standard:

Determine total menthol by the percent U. S. P. formula, then multiply the percent thus determined by $\frac{100 - (P \times 0.212)}{100}$, the symbol P standing for the percent of menthol present in the oil as ester. The full expression will read:

$$\text{Percentage of total menthol} = \frac{A \times 7.808}{B - (A \times 0.021)} \times \frac{100 - (P \times 0.212)}{100}.$$

Example: Ten Gm. of a given sample of oil consume in saponification 7 mils of half-normal alcoholic alkali, while 5 Gm. of the acetylized oil consume 30 mils. By the U. S. P. formula, the sample contains 53.48 percent total menthol. By either of the modified formulas here proposed the percentage is reduced to a little less than 52.9 percent.

All that has been said in criticism of the U. S. P. assay for oil of peppermint applies, *mutalis mutandis*, to that for oil of rosemary. The second of the two modified formulas given above requires only the change in the numerator from 7.808 to 7.707 when borneol instead of menthol is to be determined.

SOME VARIATIONS IN CINCHONA BARK AND ITS PREPARATIONS.*

BY HUGO H. SCHAEFER.

Ever since the outbreak of this great war much has been said of the low grade cinchona barks on the market. Numerous samples have been brought to the author's attention which failed to pass the U. S. P. requirements. This, of course, is largely due to the fact that owing to the derangement of shipping facilities the regular supply of Java Cinchona has been interfered with, thereby resulting in a shortage of this high grade bark. The result is that the price of bark has increased considerably and new sources of cinchona are being sought all over the world. Many of these barks have not been investigated and upon analysis are found to be very low in alkaloidal content. This, of course, is supposed to be taken care of in the U. S. P. IX by its requirement of 5% total alkaloids. Quinine, however, as we know is the most important alkaloid in cinchona bark. The U. S. P. VIII required 5% total alkaloids, and 4% ether-soluble, the latter representing an approximation of the quinine content. In the latest revision, however, this ether-soluble requirement was omitted, possibly due to the fact that in the usual cinchona barks the proportions of the various alkaloids do not vary greatly. In the last few years, however, the author has had occasion to assay a number of samples of cinchona bark and its preparations containing 5% or more of total alkaloids but comparatively little quinine or ether-soluble alkaloids. These barks, after being reduced to a No. 60 powder, were assayed according to the U. S. P. IX for total alkaloids using, however, double quantity of bark solvents, etc. The bark was extracted with the ether-chloroform mixture, the latter made alkaline with ammonia, the water added to cause the drug to settle and the aliquot portion of the solvent decanted. This was completely shaken out with weak sulphuric acid and the volume of this acid extract made up to exactly 100 mils with water. This then contained the alkaloids of 8 Gm. of drug. One-

* Read before Scientific Section, A. Ph. A., Chicago meeting, 1918.

half, or exactly 50 mils of it, representing 4 Gm. of drug was used for determining the total alkaloids by extracting with chloroform, evaporating the solvent, drying, and weighing the residue, the other half was extracted with ether in accordance with U. S. P. VIII to determine ether-soluble alkaloids. Following are the results of five samples found to contain more than 5% total alkaloids but less than 4% ether-soluble:

U. S. P. IX = Not less than 5 percent total alkaloid.
U. S. P. VIII = At least 5 percent total and 4 percent ether-soluble alkaloids.

	Total alkaloids.	Ether-soluble alkaloids.
1	5.32	3.42
2	5.83	2.92
3	6.01	3.01
4	5.52	2.98
5	5.08	2.67

The question at once arose as to whether any of such barks had been used in making preparations and with this in view a number of tinctures obtained on the open market were analyzed in accordance with U. S. P. IX for total alkaloids by evaporating 25 mils of the sample, incorporating with sawdust, drying and proceeding as directed under Cinchona. The residue of total alkaloids so obtained was then redissolved in dilute sulphuric acid and assayed for ether-soluble alkaloids in accordance with directions given under Fluid Extract of Cinchona of the U. S. P. VIII, which was also the method used for assaying the tincture.

By far the greater number of samples passed both the requirements of the old as well as of the new Pharmacopoeia, but the following results were obtained from three of the tinctures:

U. S. P. IX = not less than 0.8 Gm. nor more than 1 Gm. total alkaloids in 100 mils.
U. S. P. VIII = 0.75 Gm. ether-soluble alkaloids in 100 mils.

	Total alkaloids. Gm. in each 100 mils.	Ether-soluble alkaloids. Gm. in each 100 mils.
A	0.912	0.64
B	0.954	0.59
C	0.983	0.49

It is interesting to note in U. S. P. VIII the directions for making Tincture of Cinchona called for the use of Cinchona yielding not less than 4% of anhydrous ether-soluble alkaloids and in the finished product the requirement was 0.75 Gm. anhydrous ether-soluble alkaloids in each 100 mils. Nothing at all is said of total alkaloids, but the ether-soluble requirement was the one considered of prime importance. In the U. S. P. IX, however, only the total alkaloidal percentage is considered irrespective of the kind of alkaloid present.

A number of samples of fluidextracts of cinchona were assayed in similar manner for both total and ether-soluble alkaloids, with the following results obtained from three of the samples:

U. S. P. IX = Not less than 4 nor more than 5 Gm. total alkaloids of cinchona in each 100 mils.
U. S. P. VIII = 4 Gm. ether-soluble anhydrous alkaloids in each 100 mils.

	Total alkaloid. Gm. in each 100 mils.	Ether-soluble alkaloids. Gm. in each 100 mils.
A	4.61	3.20
B	4.23	3.01
C	4.01	2.92

Here also the U. S. P. VIII simply considered ether-soluble alkaloids and the U. S. P. IX only total alkaloids. All these facts seem to show that the requirements of the new Pharmacopoeia are lower than those of the old. For example, a fluidextract of cinchona according to U. S. P. IX may pass with 4 Gm. total alkaloids in 100 mils while the U. S. P. VIII required at least 4% ether-soluble alkaloids.

In the opinion of the author it would be much better to have requirements for both total and ether-soluble alkaloids for Cinchona and its preparations. Quinine is, of course, the most important and active alkaloid present and the ether-soluble alkaloidal factor is a fairly good check on the percentage of quinine present. Especially, at present, when such a large variety of cinchona barks are being placed on the market, a close check on the quality should be kept.

RESEARCH AND THE UNITED STATES PHARMACOPOEIA.*

BY A. H. CLARK.

The question of Pharmacopoeial Revision is now a very live one. Much has been published within the past year regarding the present plan of revision. Many suggestions have also been made as to changes which might lead to an improvement in the present arrangements. In this paper only one phase of this important subject is discussed—research in connection with the scientific problems involved. Only by thorough and accurate research can any of the objectionable features of the present scientific work of the Pharmacopoeia be overcome.

When I became a member of the present Committee I was a stranger to revision methods, and also somewhat younger and much less experienced. Both of these factors operated to give me abundant enthusiasm. I immediately set out to demonstrate by a thorough investigation of the literature the correctness of all statements made in the Book and, if necessary, confirm them by experiments conducted by myself or under my directions. Alas! Before proceeding very far along this path I was hopelessly lost in the wilderness. Some of the statements made did not seem to have any source in the literature. Effort was then made to demonstrate by actual experiment whether or not these statements were true. Again, disappointment! In some cases the experiments led so far into the maze of scientific thought that I was completely lost. Other statements, while involving apparently simple question of theory, were found to be so complicated in fact that experiments undertaken to decide them seemed to involve work without end. Finally nearly all of my dreams vanished in the mists of reality, for it was found to be physically impossible to accomplish even a small portion of the things I had hoped to do. It is not unlikely that others have had the same dreams and disappointments.

The instructions for the last revision were to change only those things that had been criticized or about which something new had been published. In other words, to base all revision upon published criticisms and to attempt no extended investigations. This has been the policy to a greater or less extent from the very beginning. It has resulted, I am sure, in some statements being handed down

* Read before Scientific Section, A. Ph. A., Chicago meeting, 1918. According to notes of the reporter there was no discussion of the paper.—Editor.

from year to year without proper verification and also in the too hasty adoption of others. Some statements seem to me to be quite useless or unimportant. No doubt some very important things have been omitted for various reasons. Finally some of the inclusions could no doubt be improved by careful study. Research should be the final judge of these questions. A few examples, that will serve as illustrations, follow:

The Pharmacopoeia states that "glycerin when of a strength between seventy and one hundred percent rapidly volatilizes at 100° C." This statement was submitted to a student of our Pharmaceutical Chemist Course and he reported that he could not trace its origin. After a number of experiments he also concluded that it was not a fact. He spent some hours on this little problem and I am not sure that he threw much light on it.

The Pharmacopoeia states that boric acid "is converted into metaboric acid when heated to 100° C. and then slowly volatilizes at that temperature." Several hours were spent trying to verify this, but finally the experiments were abandoned because so many factors were involved which complicated the work.

These two statements seem to me to be of little or no importance, yet if they are to be included they should be true to fact. If carefully conducted research throws any doubt upon them they surely should be omitted.

As examples of those things which are important and seem to need revision attention might be called to the directions for the titration of nitric acid with methyl orange; the test for chlorination products in benzaldehyde; the titration of phosphoric acid, and the test for methyl alcohol in ethyl alcohol. Some of our students have been working on these problems, and although we have spent many hours on them I am yet far from satisfied with the result of our labors.

Instances of pharmacopoeial descriptions that lack completeness may be matters of opinion, but I have had some students working on a few such problems for many hours with relatively insignificant results.

All of this indicates the necessity for more research in connection with pharmacopoeial revision problems, and gives an idea of the immense amount of time and labor involved in its support. It brings us to the question of how these things can be done. First of all, what agencies shall be selected to conduct such researches?

THE AGENCIES TO BE EMPLOYED.

As to this question there will no doubt be a wide diversity of opinion. Some of the following seem to be available:

The United States Pharmacopoeial Convention.
The United States Government.
The American Pharmaceutical Association.
The American Medical Association.
The American Chemical Society.
The Association of Official Agricultural Chemists.
The Universities.
The Colleges of Pharmacy.
The Medical Colleges.
Research Laboratories of Manufacturers.
Privately Owned Research Laboratories.

These are mentioned, and more could be added. The very important question is, the means to be employed for carrying on such researches.

THE MEANS OF CONDUCTING RESEARCHES FOR PHARMACOPOEIAL REVISION.

The very first thing to consider in this connection is funds. To my mind this work can never be carried on successfully without the liberal expenditure of money in the form of compensation to those who do the work, for the necessary supplies, equipment and other expenses. No one will deny that the best talent of the country has contributed to the present revision. The men doing the work have given freely of their time, and even money, and have accomplished much. I am sure, however, that they are all similarly situated in that their income for the present, and the future as well, depends entirely upon their activities in other fields. Under such conditions no one can expect these men to give their time to such investigations, as heretofore indicated, without proper compensation. The honorariums distributed, or the salaries that have been paid, are no incentive to diligent work when they are given to men whose time is worth ten or a hundred times such amount. These men will, and with perfect justification, give their time to the work which brings them the fixed income; what little remains will be devoted to revision problems. The only way, then, is to pay a small number of men salaries which will justify their devoting all of their time to work on the Pharmacopoeia. We can then look for thorough and competent research when the funds and men are provided, and there is some competent authority to furnish these.

REVISION AUTHORITIES.

There are few sources from which this authority for conduct of the Revision might come. In fact, of the agencies mentioned, only two seem to be available. These are the United States Pharmacopoeial Convention and the Government of the United States. The present Convention might assume this authority and elect a properly paid chairman, who would devote all of his time to the work and be the executive head of the Committee on Revision. The Convention might empower him to engage experts and appropriate sufficient funds for salaries that will secure their entire time. To these men, working together at some central point, all questions of a scientific nature could be submitted. They could test the accuracy of all statements made, determine their usefulness, test methods of assay, and the like. This would require considerable money, but this can be derived from the sale of the Pharmacopoeia, increasing the price if necessary. Legal and political questions, scope, editing, and the like, could all be handled by the General Committee.

Then there is the Government. It certainly has the money needed for such work. It also has abundant laboratory and library facilities. It would undoubtedly organize the work more quickly than any other force that could be employed for the purpose and, no doubt, do this with less expense than any other. It has the advantage of being a permanent organization and its efforts would thus be continuous. Its findings would also have the weight of authority and would, no doubt, remove some of the objections to the present connection between thePharmacopoeia and the Food and Drugs Act. It would have the authority to secure from other sources much information which no other body of men has. It could

also secure more coöperation from universities, colleges, scientific societies, manufacturers, and all Government departments, than any other organization. Authority to make final decisions and to promulgate them is much needed in cases such as this and the Government certainly has this authority.

I am quite sure that none of the other organizations mentioned would care to shoulder the financial obligations without adequate returns. The American Medical Association has a well equipped laboratory and for a number of years has been doing just the kind of work that should be done in connection with pharmacopoeial revision. The American Pharmaceutical Association is just entering the field. Its available fund for research is insignificant, however, and it remains to be seen what position it will occupy in this domain.

None of the other agencies mentioned could be expected to shoulder the burden. There are then really only two available agencies for the work, namely, the Government and the United States Pharmacopoeial Convention. Might not these two agencies, working together, be utilized to good advantage? I have always held that the purely scientific portions of the Pharmacopoeia: the technical descriptions of the drugs and chemicals, assay methods and the like, should be published in one volume; the information required by pharmacists and physicians in their daily work in another. The former could be made far more useful to the chemist, manufacturer, Government administrator and the like than the present book. The latter, containing such information as doses, solubilities, formulas for pharmaceutical preparations, etc., could also be made more satisfactory to the physician and pharmacist, I am sure. Might not the Committee of Revision prepare the one, and the Government the other? One could be made the physicians' and pharmacists' guide, the other a book of standards for those requiring it. I believe that all scientific questions, involved in preparing the Pharmacopoeia, would be solved by adopting this or a related plan. Then declare in 1920 the present Pharmacopoeia, with any changes that may be suggested by experience up to that time, as the tenth revision; proceed at once to prepare the eleventh revision, spending the entire ten years, if necessary, but have it ready for adoption promptly in 1930. Any serious defects discovered in the meantime could be corrected by authoritative bulletins. By following this plan, in a few decades a book would be evolved that would be so nearly perfect that the periodical discussion of ways and means for Pharmacopoeial Revision would find no place in print.

UNIVERSITY OF ILLINOIS
SCHOOL OF PHARMACY.

BOTANICALS OF THE BLUE RIDGE.*

BY CLARE OLIN EWING AND ERNEST ELWOOD STANFORD.

The Bureau of Chemistry, in its activities in connection with the enforcement of the Food and Drugs Act, exercises supervision over crude drug products in general. While heretofore the greater volume and variety of foreign drug supplies has necessitated a more intensive study of these products, American medicinals have not been neglected. Owing to war conditions, American drug produc-

* A Contribution from the Pharmacognosy Laboratory, Bureau of Chemistry, Department of Agriculture, Washington, D. C.

tion has attained an added importance. For several decades the Southern Appalachian region has been the chief source of American botanical drug supplies. These materials have come chiefly from the Blue Ridge in North Carolina and its continuation into Virginia. Lesser supplies come also from Tennessee, Kentucky, and other states of the region. The increasing relative importance of the American industry rendered advisable a brief survey of the Blue Ridge region and its products. Some of the information acquired during this survey is believed to be of general interest.

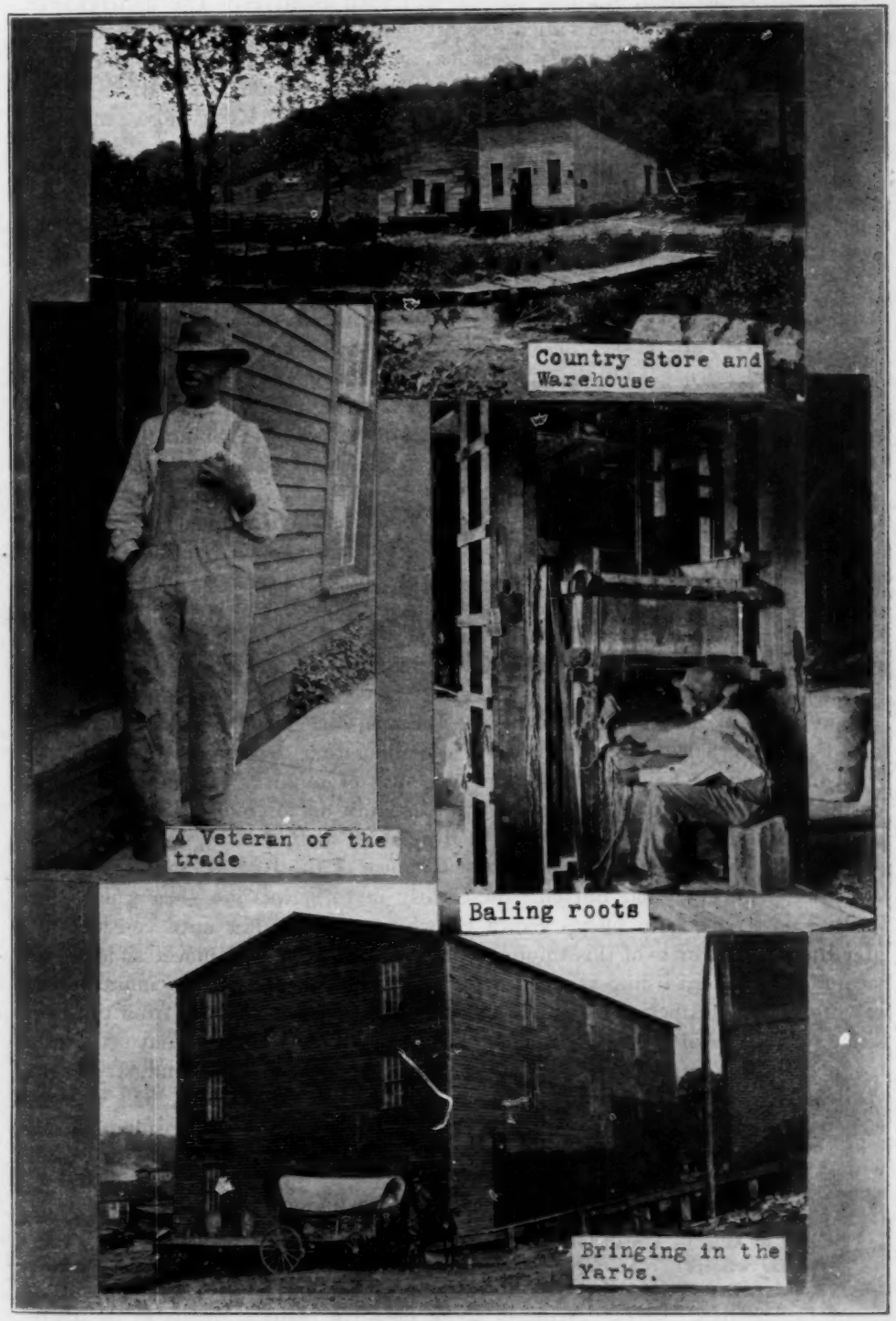
North Carolina and Southern Virginia, whence come the larger proportion of botanical drugs, possess an extremely varied flora. Three physiographic zones may briefly be distinguished. The coastal plain of North Carolina, and its prolongation, tide-water Virginia, are low, frequently swampy in character, with sandy soil. The drier portions of the plain possess few plant species; a larger number are found in the swamps and along the streams. From the standpoint of drug production, the zone is of minor interest. It ends at the so-called fall-line, a generally abrupt height of land which in North Carolina runs in a devious line about 150 miles from the coast. Here begins the Piedmont. In topography the Piedmont is a rolling plain; its soil is predominantly of a clayey character, Indian-red in color, poor in humus, and much subject to erosion. Its flora is somewhat more varied than that of the plain; the greatest number of species is found in the alluvial soil of the river bottoms. In the western Piedmont considerable drug collection takes place, the chief centers being Statesville and North Wilkesboro, N. C., which also draw large supplies from the mountain region.

This mountain region, which, after its principal chain, may be called the Blue Ridge region, rises abruptly in western North Carolina and Virginia. It is an area of precipitous hillsides, of sharp and narrow valleys. Close to the eastern foot of the ridge in North Carolina, and somewhat more distant in Virginia, runs the thousand-foot level, which may be said to be the limit of the Piedmont. The average elevation of the mountain region of North Carolina is 2700 feet;[1] Mount Mitchell, the highest point east of the Rockies, reaches 6711 feet, and a number of other peaks pass 6000 feet. The soils of this zone vary somewhat in character. Clay soils and loams predominate. Wheat, corn, rye, and other cereals are important crops, and cattle feeding and cheese-making are considerable industries. The steepness of the hillsides, the comparative lack of railroad facilities, and the general lack of good roads have prevented the Blue Ridge region from attaining any great agricultural importance. Most promising, perhaps, from the farmer's viewpoint, is the extreme northwestern portion of North Carolina. Grass and clover, which take but a precarious hold on the eastern slope and Piedmont, thrive on the more loamy soil of the western slope. The greater portion of the region, however, is covered by dense forests.

In the mountain zone the plant growth exhibits wonderful variety. In the valleys and lower slopes chestnuts, oaks, and hickories predominate. Higher up, white pine, spruce, hemlock, and balsam are found. The higher peaks extend above the timber-line. The shrubs and herbaceous plants of the higher altitudes are characteristic; alpine, but hardly northern, consisting chiefly of Ericaceous

[1] Joseph Hyde Pratt, North Carolina Geological and Economic Survey Bulletin 17, 13 (1908).

Snapshots from the Blue Ridge Section



Native Botanic Drug Industry of U. S.

species—Rhododendron, Kalmia, Azalea, and their relatives. The undergrowth of the mountainsides is both varied and luxuriant. Here, beneath characteristically northern chestnuts, birches, white pines, and elms, are found shrubs as characteristically southern—the ever-present rhododendron, wahoo, black haw, honeysuckle, trumpet-creeper, hydrangea, and hosts of others. Even more numerous are the herbaceous plants.

This mountain zone, the region of the Blue Ridge, is America's chief source of native botanic drugs. It furnishes, perhaps, 75 percent of such supplies. The chief commercial centers of the drug production of this region, besides those already mentioned, are Asheville, North Carolina, and Marion, Virginia.

In the luxuriant flora of the Blue Ridge are found perhaps six hundred or more species which, at some time, have had medicinal application. Some—the majority, indeed, are obsolete, cast off and forgotten by the wayside of experience or of medical science. Others, lightly held by the medical profession, survive, commercially at least. A few—a very few—rank high in the materia medica of to-day. It may be that science, stimulated by war, will yet winnow trophies of value from the discards of yesterday, perhaps too hastily cast aside on scanty trial.

The early history of the crude drug industry of this region is rather obscure. A considerable number of the drugs bear, locally, Indian names, and tradition states that the settlers learned their use from the red men. Undoubtedly this is true in part, but a survey of the early literature indicates that the Indian medical lore was rather more scanty than is popularly supposed. Peter Smith, "of the Miami Country," whose Indian Doctor's Dispensatory[2] treats of a number of botanics of this region and of the plains northward, remarks:

"I call myself an *Indian Doctor*, because I have incidentally obtained a knowledge of many of the simples used by the Indians; but chiefly because I have obtained my knowledge generally in the like manner that the Indians do."

Quite likely we have to thank other pale faces of inquiring or commercial mind for many of our "Indian simples," as we certainly do for most of the "Indian" panaceas and cure-alls which adorn our drug-store shelves.

While a considerable number of the botanics of the Blue Ridge were known to Cutler,[3] Schoepf,[4] and Barton,[5] these early investigators got their knowledge for the most part from plants grown elsewhere. It was not until considerably later that the products of this thinly settled and comparatively inaccessible region became of commercial importance. Previous to the Civil War, Cincinnati, Ohio, was the principal American drug market, and such supplies as came from the Blue Ridge region probably traveled thence from the western slope. About fifty years ago, according to statements of various dealers, the drug-shipping industry began to be of commercial importance in North Carolina. Statesville, N. C., was the early center of this industry. In later years, buying firms of considerable size

[2] Peter Smith, "The Indian Doctor's Dispensatory," Cincinnati, Reprint, Bul. Lloyd Library 2, 1901 (1813).

[3] Manasseh Cutler, "An Account of Some of the Vegetable Productions Naturally Growing in This Part of America, Philadelphia, 1785," Reprint Bul. Lloyd Library No. 7, 1903.

[4] J. D. Schoepf, "Materia Medica Americana potissimum regnii vegetabilis, Erlanger, 1787," Reprint, Bul. Lloyd Library No. 6, 1903.

[5] B. S. Barton, "Collections for an Essay toward a Materia Medica of the United States, Philadelphia, 1798–1804," Reprint, Bul. Lloyd Library No. 1, 1900.

have developed also at Asheville and North Wilkesboro, N. C., and Marion, Va. Lesser centers are found at West Jefferson, N. C., Elizabethtown, Tenn., Bristol, Tenn., Pikeville, Ky., and other places, but in general they are tributary to the larger centers mentioned.

Crude drugs are collected in small amounts by a large proportion of the people of the mountains. Few, or none, gather drugs as a chief occupation. The mountaineers, in general, make their principal living on tiny hillside clearings. Because of the rugged character of the land, which unfits it for machine farming, large plantations are rarely found. Marketing of farm crops in large amounts is also difficult, owing to the steep grades and poor repair of the mountain roads, which in many places are little more than bridle paths. Work away from the farms is normally scarce and wages extremely low. Drug collection is carried on largely when no other work offers, chiefly by the women and children, and is a rather haphazard process. The men, in general, consider such occupations beneath them, and collect, ostensibly, only heavy and bulky products, such as barks of the larger trees, and bring in the other products with an apologetic "Here's some yarbs the women got." The principal collecting seasons are spring, when most barks and some roots are gathered, and late summer, when the crops no longer need cultivating, and herbs, leaves, and flowers abound, and roots may be distinguished by the herbage. Some products, of course, are necessarily collected at other times, but convenience rather than the Pharmacopoeia governs the season.

The collectors usually barter their wares in small quantities for necessities from the local store. The country storekeeper, in his turn, generally has a contract arrangement with the wholesale dealer in crude drugs, and turns over his receipts in exchange for stocks of dry-goods or groceries. Some wholesalers, however, buy for cash. Those dealers who conduct both a cash and exchange business give slightly higher rates in goods.

After inspection of the drugs, the wholesalers condition such as they deem advisable, by garbling, drying, or otherwise. For storage they are usually placed in gunny sacks, but may also be baled. Baling presses are usually run by hand, but mechanical presses of a simple type are used in some establishments. As a rule, the drugs are shipped in bales, varying greatly in weight according to the commodity.

While a call for Sanguinaria, Veratrum, or Podophyllum would mean little to the mountaineer or his wife, they collect bloodroot, hellebore, mayapple, etc., with considerable precision. Occasional instances of substitution, usually, it appears, unintentional, take place. Cimicifuga,—black cohosh or black snakeroot—is frequently admixed with red cohosh (*Actaea rubra*), whose foliage and roots are very similar to those of the official drug. The same is true of American angelica (*Angelica atropurpurea*) and spikenard (*Aralia racemosa*). Star grass root (*Aletris farinosa*) and false unicorn root (*Chamaelirium luteum*) are still occasionally confused. Beth root (*Trillium erectum*) is also mixed with Helonias, although there is no similarity in the above-ground parts. Prickly-ash bark (*Xanthoxylum carolinianum*) may be mixed with that of prickly elder (*Aralia spinosa*). The mints, spearmint (*Mentha spicata*) and peppermint (*Mentha piperita*) are also frequently confused. Hoarhound (*Marrubium vulgare*) and catnip (*Nepeta cataria*) are sometimes confused. The rootbark of dogwood

(*Cornus florida*) is said to be mixed with that of black haw (*Viburnum prunifolium*). Gross adulteration or substitution is said to be rare, though a good sized rock or other material of more weight than value occasionally turns up. Such things, however, are easily traced to their origin, which tends to discourage the practice.

Not many grades are made of these products. Herbs, including stems, usually bring considerably less than the leaves alone. This is in line with official specifications of most standardized drugs, which usually discriminate against stems. Many roots are quoted "with fibers" and "without fibers," the fibers being the smaller rootlets. The fibers are said to be difficult to grind, and roots without them usually bring a higher price, though the difference is, one would think, hardly sufficient to pay for the tedious task of getting them off. Small roots and root-hairs, moreover, would probably have a tendency to raise the ash content. Color of root alone is not necessarily indicative of quality, as it is influenced greatly by the type of soil in which the plant has grown. Particularly noticeable, oftentimes, is the red color due to the tenacious, finely divided clay to which reference has previously been made. Barks of roots usually cost more than barks of trees or shrubs; this, also, is usually due to official specifications or to supposedly superior therapeutic value as well as to the greater expense of digging. Barks of the larger sorts are usually rossed, *i. e.*, deprived of their outer rough layers with a draw-knife before peeling. They are graded in some instances according to age of tree. Wild cherry, which is in particular demand at present, runs through five grades, which, at the time of our survey, were quoted and priced as follows: Young, thin, free from wood and green skin, 7 c.; medium, 6 c.; young, thin, unrossed, 5 c.; thick rossed, 5 c.; thick unrossed, 3 c.

On the whole, curing is said to be rather carefully carried out. Leaves and herbs are usually dried as rapidly as possible, preferably in the shade. Strong sunlight tends to destroy the chlorophyll, and buyers prefer bright green products. Different flowers require different treatment; elder flowers are dried in a day in the sun, while red clover requires shade, and a curing period of a month or more. This is usually completed in the wholesale warehouse, as heating may follow premature baling. Berries—poke, horse-nettle and the like—cure with difficulty, and may heat or ferment in the warehouse. Roots are usually split to facilitate drying. Ginseng is an exception. Split ginseng does not appeal to the psychology of the Chinaman, who takes the entire output. Roots, perhaps, are more subject to improper curing than any other product of the region. Many, especially of the fleshy roots, are quite hygroscopic, and fall an easy prey to molds. Others, as bamboo briar and skunk cabbage roots, are quite liable to insect attack in storage. Podophyllum, on the contrary, has the reputation of never becoming wormy. Barks receive no specially careful curing. Some of these, too, are very liable to insect attack; white pine bark is not usually kept over a year on this account.

Many dealers issue instructions for drug collection and drying on their regular buying lists. Most firms claim to refuse improperly prepared or low grade material, or to cut its buying price severely. Some deduct 10 percent from the price for undried or improperly dried commodities.

These buying lists are issued at short intervals by the wholesale buyers, and usually quote prices on 100 to 200 different articles. Of these, perhaps, fifty may be considered as staples, and include three-fourths or more of the annual trade.

Among these may be mentioned the barks of wild cherry, white pine, wahoo, cotton-root, sassafras root, and several viburnum species, the roots of angelica, black cohosh, bloodroot, burdock, calamus, goldenseal, hellebore, senega, poke, may-apple, lady's slipper, spikenard, American sarsaparilla, aletris, helonias, and yellow dock; the leaves of herbs of boneset, catnip, hoarhound, stramonium, lobelia, liver-wort, pennyroyal, peppermint, spearmint, and squaw vine; flowers of red clover and elder; buds of balm of gilead or balsam-poplar; seeds of lobelia and chenopodium; cornsilk.

Among products more or less commonly listed, which have at least occasional sale for medicinal purposes, but which receive scanty consideration or no mention at all from the regular dispensatories and modern therapeutic authorities, mention may be made of arbor vitae leaves (*Chamaecyparis thyeoides*), burdock leaves and seed (*Arctium lappa*), comfrey root (*Symphytum officinale*), elder berries (*Sambucus canadensis*), hive vine or squaw vine (*Mitchella repens*), ground ivy vine (*Nepeta hederacea*), Indian turnip or jack-in-the-pulpit root (*Arisaema triphyllum*), milkweed or silkweed root (*Asclepias syriaca*), poison oak leaves (*Rhus toxicodendron*), Queen of the Meadow root, and leaves (*Eupatorium purpureum*), tag-alder bark (*Alnus incana*), Turkey corn (*Dicentra canadensis*), white clover flowers (*Trifolium repens*), wild potato root (*Ipomoea pandurata*), yellow root (*Xanthorrhiza apiifolia*), wild and garden lettuce leaves (*Lactuca* spp.), strawberry leaves (*Fragaria* spp.), balmony leaves (*Chelone glabra*), cleavers herb (*Galium* spp.), gravel plant (*Epigaea repens*), dogwood flowers and leaves (*Cornus florida*), dittany bark (*Cunila origanoides*), green osier bark (*Cornus circinata*), ox-eye daisy flowers (*Chrysanthemum leucanthemum*), raspberry leaves (*Rubus idaeus*), skunk cabbage root (*Symplocarpus foetidus*), bamboo briar root (*Smilax* spp.), mould bean leaves (*Rinicus communis*), and others far beyond space to mention. These products, as well as large quantities of the better-known products of the region, presumably are used chiefly in the manufacture of patent medicines.

Prices, of course, vary widely. They run, usually, from 30 to 60 percent of the New York wholesale price. Wild ginseng may reach $11.00 and the cultivated root $4.00, but this commodity is very unstable. Goldenseal is priced at from $4.25 to $4.50. Other roots bring from 2 c. to 65 c., being as a class the highest priced commodity, with the exception of flowers, of which, however, very few species are quoted. Herbs and leaves do not usually exceed twelve cents, and are the lowest priced of any class. Barks run from 3 c. in low, unrossed grades, to 25 c. for some root barks. A general average of several lists, excluding ginseng and goldenseal, gave a mean of about 8 c. per pound. While it is difficult to say what an average day's work would yield a drug collector, it may readily be seen that poor roads are not the only reason why the mountaineer markets his product by mule-wagon or ox-cart rather than by automobile. Probably a dollar or two per day would approximate the average receipts, although much more, with good luck, may be cleared on certain products. Products in large demand, of course, bear prices calculated to stimulate collection, and in addition are generally noted in large type. In case of continued shortage, dealers seek supplies from their own number more frequently than they order specially from collectors. Exceptions to this rule sometimes occur, especially in the case of fresh, uncured drugs, which are not quoted in regular lists. Relatively small quantities

of these are bought; they are shipped by express or else packed in an alcoholic menstruum in specially constructed barrels, and sent by freight. Commonly collected fresh drugs are passion-flower, horse-nettle, yarrow herbs, and elder flowers. Fresh corn silk (N. F. IV) is generally a by-product of canning factories, and is not obtained in the Blue Ridge. Considerable quantities of dry corn silk, however, originate there. Pollen, too, is occasionally collected on order, and brings a price commensurate with the difficulties of its collection. Pollens most in demand are those of ragweed and goldenrod, for use in the preparation of hay-fever serums.

The firms of the Blue Ridge region, with one exception, grind no drugs.

Incoming stocks are, in some cases, inspected by the dealer in person. A number of firms employ comparatively young men as inspectors; in other cases, veterans grown old in the trade pass on the drugs. These inspectors, apparently without exception, are without scholastic training in science and in some cases are quite illiterate. Scientific names of drugs are almost unknown. Microscopic and chemical tests are not resorted to. Even a hand-lens is rarely or never used. Appearance, odor, taste and "feel" are the chief criteria. With long experience, these inspectors attain a remarkable proficiency. Some even claim sound as definitive. One veteran, in search of certain material, went through a pile of unmarked bags, announcing the contents of each after a thrust or shake. Interrogation brought forth the modest response "I reckon I tell 'em by the rattle."

Colored help is frequently employed in the warehouses, but the inspectors are almost invariably white. One colored veteran, however, boasted an experience of forty-two years; while unable to read or write, he has a wide reputation as a "doctor" among his own race, and even claims to "send medicines North." The knowledge of these inspectors as to the various properties of the products they handle, and of other locally used "medicinals," is an interesting blend of hearsay, superstition, tradition, and folk-lore, some of which, indeed, is hardly peculiar to this region alone. Beech-drops (*Epiphegus virginiana*) "drop from the beech limbs and take root." "Mould" bean is so called in the erratic local orthography because it "keeps moles out of the gardens." As castor bean, this plant has attained rather a wider celebrity. Spice wood leaves, dittany tea, and a tea made from the excrement of sheep, are sovereign remedies to "bust out measles." Buckeyes are carried in the pocket as a cure for piles. Black willow buds and bark are "a great friend to man" for their anaphrodisiac qualities. Pennyroyal leaves and cotton-root bark are said to be in common use as domestic ecbolics, although observations in the region would lead one to doubt their universal efficacy.

In character the wholesale warehouses are quite variable. Few appear to have been especially constructed for the purpose. Wooden buildings predominate, and are claimed to facilitate drying. Brick warehouses are occasionally seen. Special devices for ventilation are not often seen, and, in case of the older wooden buildings, are hardly required. No special precautions to render the warehouses rat-proof appear to be taken, and occasional evidence of the depredations of rodents were seen. Cats are sometimes kept, but appear to prefer to sleep on the bales of catnip rather than pursue the elusive rat. Worms may be guarded against by keeping only small, rapidly moving warehouse stocks of specially susceptible items. Fumigation, apparently, is never resorted to. In general, the

stocks of drugs appeared to be in good condition, moldiness being seen only in a few instances. Stocks of the principal staples move quite rapidly, but small quantities of the less-known medicinals are apt to be more than in one sense, drugs on the market. The presence of worms appears to be the main criterion of deterioration.

Stocks sometimes are sold by sample. More frequently, however, material is sold on the dealers' guarantee, but the larger manufacturing firms employ experts whose province it is to pass on identity and quality of crude drug purchases. Manufacturers' buyers also occasionally visit the warehouses, and rather rarely the dealer makes a selling trip to the chief manufacturing centers.

The drug trade of the Blue Ridge has, of course, been profoundly affected by war conditions. In the earlier years of the war only a few items were affected, as competition with foreign products was indirect rather than direct. About 1917, however, buying prices, which had been quite staple for a number of years, were generally increased. Collections increased likewise; the output in 1917, in most localities, is said to have been unprecedented. This year prices have again been increased but results have been widely different. The young men have been drafted. The remaining men, who formerly found it difficult to obtain work away from home, and when work did offer could collect a daily wage of but a dollar or two, now find ready employment in the cities, sometimes nearer home, at three to five dollars a day. This is particularly true around Asheville, near which city several training camps and army hospitals are located. The younger women, in many instances, find positions in the stores and factories of the larger towns and cities. Wheat, corn, beef, and other agricultural products have risen in price, and women and children who formerly collected drug products have taken the place of the men in the fields. In spite of the increased prices of botanicals, dealers generally estimate that collections have fallen off from 25 to 50 percent, with few exceptions. Red clover blooms, formerly supplied by Germany, have quadrupled in price, and are largely collected. One dealer stated that they were "picked by an apparatus with fingers." Probably this referred to something of the berry-stripper type. No other reports of anything of this nature were heard; pickers were frequently observed collecting the flowers by hand. White pine and wild cherry barks and balm of gilead buds are largely collected, owing, no doubt, to their extensive use in preparations for pulmonary and bronchial complaints. Cotton-root bark is in large demand, owing, quite likely, to the shortage of ergot. American sarsaparilla (*Aralia nudicaulis*) is in considerable request as a substitute for the imported *Smilax* species. The trade in corn silk (dried), and elder flowers, has increased since the virtual cessation of foreign supplies. American angelica is in great demand for chewing tobacco manufacture. Deertongue leaves, used in smoking tobacco as a source of coumarin, are not being largely collected at present, in spite of the shortage of tonka beans. One prominent tobacco manufacturer stated that they are unsatisfactory on account of their comparatively large bulk and low coumarin content.

Dealers of the Blue Ridge region carry on but a relatively small export trade, and have, apparently, not been seriously inconvenienced by export regulations save in case of ginseng and in some exports to Canada. Domestic shipping difficulties have contributed, however, to the uncertainty of the situation. On ac-

count of labor supply, and shipping troubles, dealers at present are somewhat reluctant to accept large contracts, or orders for future delivery.

The future of the Blue Ridge drug industry is therefore somewhat uncertain. It is quite true that many of the products of this region could well be spared, but others would be sadly missed. Apparently no marked increase in output is to be looked for, at anything like present prices. The recent widespread interest in drug cultivation will hardly affect most of these products. The very few which are produced by cultivation, like red clover flowers and corn silk, are only incidental by-products of commercially more important crops. Natural supplies of the majority of important items are, no doubt, sufficient for many years to come. It is not unreasonable to suppose that increasing prices will result in sufficient collections of indispensables, while many of the useless species which have heretofore competed with them for the herb-gatherer's attention will, it is to be hoped, fall by the wayside.

COUCH GRASS *versus* BERMUDA GRASS.*

BY E. N. GATHERCOAL.

The drug couch grass, Triticum U. S. P., has been recently reported as adulterated or substituted with the dry rhizome of Bermuda grass.[1] Triticum is defined in the U. S. Pharmacopoeia as the dried rhizome and roots of *Agropyron repens* (Fam. Gramineae) gathered in the spring. Other English synonyms for Triticum are quack grass, dog grass, twitch grass, quickens, quitch, etc. Bermuda grass is the dried rhizome and roots of *Capriola dactylon*. It is also called Scotch grass, dog-tooth grass, wire grass, cane grass, Bahama grass, etc.

Bermuda grass is native to the Mediterranean basin and couch grass is common a little further north and throughout Europe. Both grasses are also found in North America, South America and Asia, the couch grass extending the further north and the Bermuda grass more into the tropics.

In the days of Dioscorides, 2000 years ago, perhaps the discussion as to the relative medicinal value of these two grass roots was a live issue. At least we know from the writings of this great teacher that the underground part of one or more grasses was used in his time as a diuretic and for vesical calculus.

The early writers on medicine generally include mention of grass root under the Greek name *Agrostis* and the Latin name *Gramen*.

Galen[2] speaks of the grass-root native to Parnassus as of greater power than that growing elsewhere and ascribes to it not only refrigerent and demulcent properties but also diuretic and lithontriptic powers. He refers also to the more slender form of the Parnassus kind of grass root and of its sweet yet very slightly sharp and bitter taste. Perhaps Galen and his disciples recognized a distinction between the grass roots we now name couch grass and Bermuda grass.

The German, French and English herbals of the 15th to 17th centuries usually

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* Read before Scientific Section, A. Ph. A., Chicago meeting, 1918.

[1] U. S. Department of Agriculture.

[2] Galen, *De simplicium medicamentorum facultatibus*, lib. VI. *Agrostis—sed interdum tamen lapides frangere assolet, siquis eam decoctam ebibat. At semen alterius quidem imbecillum estieius vero quae in Parnaso nascilur, urinam ciet—tenuium partium et subacerba.*

mention and describe the drug *Gramen* (Dodonaeus, Gerarde). During this time an attempt at the classification of plants was being made and an increased knowledge of their characteristics acquired.

FIG. 1.—Couch Grass × 1/4.

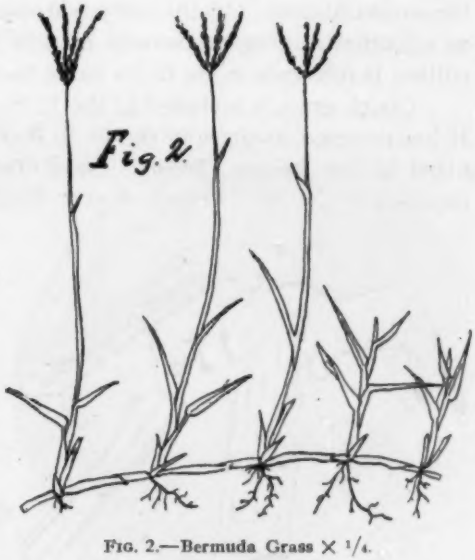

FIG. 2.—Bermuda Grass × 1/4.

J. Dalecamps (1587) describes three common grasses under the title *Gramen vulgare*. Of these, *Gramen vulgare, Dodonaei*, in description and illustration much resembles couch grass, while *Gramen vulgare, Dalecampii* is undoubtedly our Bermuda grass. He says, describing the grass of Dodonaeus (our couch grass):

"The grass of Dodonaeus, the French *Dent de chien*, is in leaves, stalks and crest not unlike the small reed-grass. Its leaves are narrow, tapering and much smaller than the leaves of the reed-grass, but tougher and larger than those of the meadow grass. The stalks are round, one and a half feet or a little more in height with four or five small nodes, and it bears a crest rather than a spike as does millet or the reed-grass but smaller and less dense. It creeps with long, white, jointed, knotty roots with a not unpleasant sweet taste, intertwining with one another, which send forth buds in many places, producing leaves and stems. It grows especially in productive fields and open lands and is destructive of the crops and a pest obnoxious to farmers, for in plowed land they must rake out the roots, gather them together and burn them. The roots are so tenacious of life that if covered with earth again, even after being dried, they revive or come to life. This grass blooms and fruits in the summer. In the autumn the roots are gathered together."

Writing of the grass of Dalecamps (our Bermuda grass), he says:

"It creeps along the ground with graceful, long, jointed, vine-like shoots, thrusting forward from its joints little roots which cling to the earth. It has long, narrow, herbaceous foliage, many stems, three-quarters as high as the grass of Dodoneus, distinct internodes and the flower spike-like, round, consisting of four or five protruding little spikes." Dalecamps refers to this elsewhere as "five-fingered grass."

Couch grass is still named in France *Petit Chiedent* and the Bermuda grass as *Gros Chiedent*.

Linne in his Flora of Sweden (1745) mentions couch grass under the title *Triticum radice repente*, as native to Sweden and the source of the medicinal grass root. Among its synonyms he mentions *Gramen caninum arvense* and states that while swine like it and grow fat upon it, dogs will vomit if they eat its leaves. Swedish names mentioned by Linne are quick-hwete, quicka- and quick-rot.

Couch grass is recognized in the early English dispensatories (Edinburgh) under the name *Gramen Caninum* and in later editions aperient and nutritive properties are ascribed to it. In the early French Codex, it is recognized under the name *Chiedent*. In the early editions of the U. S. Dispensatory it is described as a European drug extensively used in Paris hospitals. Not until the thirteenth edition is reference made to its value therapeutically as a diuretic.

Couch grass is included in the U. S. Pharmacopoeia first in the 1880 revision. It has retained its place in the U. S. P even in the latest revision and is also recognized in the British, French, Swiss, Belgian, Austrian and Hungarian pharmacopoeias.

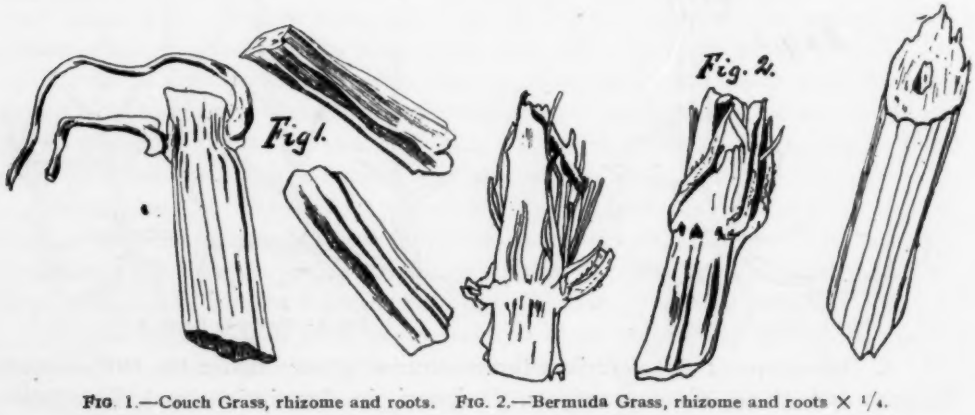

FIG. 1.—Couch Grass, rhizome and roots. FIG. 2.—Bermuda Grass, rhizome and roots × 1/4.

Bermuda grass has not generally been mentioned as a drug by authors from the central and northern parts of Europe, but has been given a place in the works of Italy, Spain and Portugal. It is official in the latest pharmacopoeias of Portugal and Spain as also in that of Mexico.

Botanically both plants are perennial grasses, the couch grass being 1 to 4 feet high and the Bermuda grass from 6 inches to 1 foot tall. The leaves of couch grass are the larger, being up to 12 inches long while those of Bermuda grass seldom exceed 2 or 3 inches in length. The flower-head on couch-grass is a spike, 2 to 8 inches long and somewhat resembles that of wheat. The flower-head of Bermuda grass is much shorter and consists of 4 or 5 small spikes which separate from one another somewhat like the fingers of the hand.

In external appearance the two drugs are quite similar. Couch grass itself varies quite markedly in size and color in various lots. Especially is the German drug thinner and darker colored than the French. Quoting from the latest revision of the U. S. Pharmacopoeia, Triticum is well described as follows:

"Usually in pieces from 4 to 12 mm. in length and from 1 to 2.5 mm. in diameter; externally light yellow or yellowish brown, longitudinally furrowed, smooth, lustrous, nodes with circular leaf-scars, a few root-scars and occasional slender roots; fracture tough, fibrous; internally lemon-yellow and with a large, hollow pith; odor slight, aromatic taste sweetish. Roots filiform, irregularly branching, attaining a length of about 5 cm. and not more than 0.5 mm. in thickness, light brown or yellowish brown, frequently covered with long root hairs."

However, the French Triticum frequently exceeds 2.5 mm. in thickness and in one lot at least was cut into pieces much longer than 12 mm.

The pieces of Bermuda grass rhizome are decidedly thicker, from 1 to 4.5 mm. thick, the average about 2.5 mm. The furrows are rather delicate and frequently appear as flutings. The internal color is inclined to be white and the cut surface mealy and the hollow pith is usually much smaller than in couch grass. The taste is mildly sweet and closely resembles that of couch grass.

Histologically—The excellent description of the structure of Triticum as given in the U. S. P is as follows:

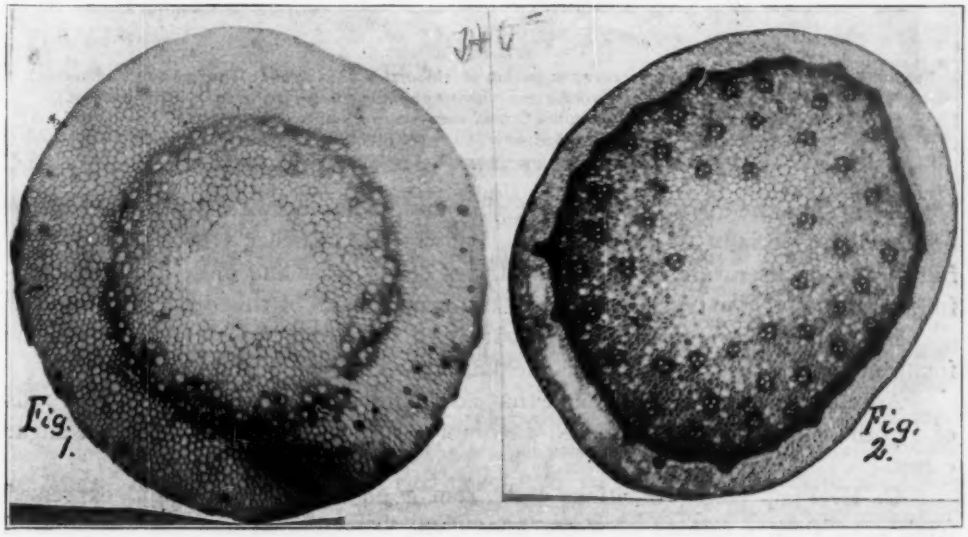

FIG. 1.—Couch Grass, transverse section of rhizome x 40. FIG. 2.—Bermuda Grass, section of rhizome × 30.

"Under the microscope, transverse sections of Triticum show a single layer of strongly lignified epidermal cells; a hypodermis of from 3 to 6 rows of more or less polygonal cells with strongly lignified walls; a cortex of from 10 to 16 rows of thin-walled parenchyma cells, occasionally with nearly spherical starch grains about 0.005 mm. in diameter, or with irregular masses of a more or less soluble carbohydrate; among the parenchyma cells and near the hypodermis occur small, widely separated fibro-vascular bundles, each with a closed sheath of sclerenchymatous fibers; an endodermis, the lateral and inner walls of the cells moderately thickened, strongly lignified and somewhat porous; several layers of sclerenchymatous fibers immediately inside the endodermal ring, in which are imbedded an interrupted circle of collateral fibro-vascular bundles having large tracheae; adjoining these are usually 8 to 10 rows of parenchyma cells with a few fibro-vascular bundles and a pith in which the parenchyma cells are more or less broken or absent."

The structure of Bermuda grass presents three striking points of difference; *viz.*, the parenchyma cells of cortex and pith are filled with starch; the endodermal layer is very inconspicuous or absent and many bundles are found inside the bast ring instead of a very few as is the case with couch grass.

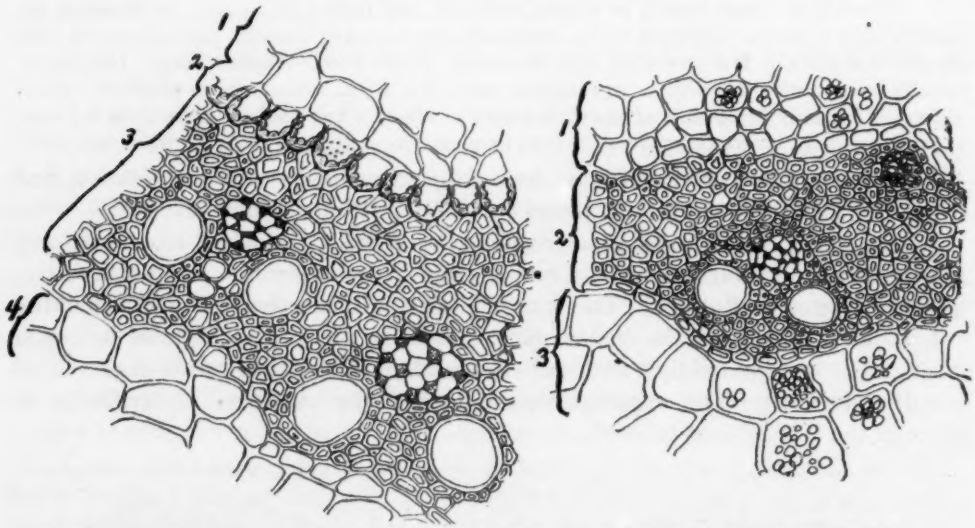

FIGURE ON LEFT.—Couch Grass, transverse section of rhizome x 230 (about); 1, parenchyma of cortex, 2, endodermis, heavily lignified; 3, woody ring with two bundles; 4, parenchyma of pith, without starch. FIGURE ON RIGHT.—Bermuda Grass, transverse section of rhizome x 210 (about); 1, parenchyma of cortex, containing starch; 2, woody ring with one wood bundle and traces of another; 3, parenchyma of pith, containing starch.

Regarding the chemistry of these rhizomes, a number of investigations have been made especially of couch grass. Ludwig and Mueller (1872) review very fully the early literature on the chemistry of couch grass and present a very carefully prepared and extensive report on the constituents of this drug.

Marggraf (1767), in discussing sources of sugar, mentions the grass-root as found in the apothecary's shops as yielding a sweet juice, but no solid sugar.

Apothecary Graff (1800) found that 20 pounds of grass-root yielded 7 pounds of "Loth" sugar, which compared favorably with the yield from certain sugar canes.

C. H. Pfaff (1808) mentions that from a pound of crushed and expressed fresh grass-root, 5 ounces of sweet juice could be obtained and this evaporated to the consistency of honey gave *Mellago* with a pleasant peculiar sweet taste. Out of 40 pounds of cut root he obtained 7 pounds *Mellago*. In 1821 Pfaff obtained a crystallized sugar from *Mellago*.

Berzelius (1837) says that Pfaff's sugar from grass-root closely resembles mannit.

Stenhouse (1844) obtains two sugars from grass-root and neither are mannite.

Ludwig and Mueller quote many other references. They summarize their own investigations as follows: Grass-root contains (1) a strongly laevogyrate (fruit) sugar; (2) a dextrogyrate sugar (not cane sugar); (3) a peculiar, nitrogenous gummy substance, easily split to a laevogyrate sugar; (4) a sweet-tasting, nitrogenous, easily split substance between the gum and fruit sugar.

Mueller further investigated the sugars of couch grass-root and triticin and concluded that neither dextrose nor cane sugar were present, but only fruit sugar to the extent of 2.5 to 3.33 percent. Triticin, present to the extent of 6 to 8 percent, is obtained by extraction with diluted alcohol and repeated purification with lead actetate which precipitates the other gummy substances. Mueller later gives the molecular formula as $C_{12}H_{22}O_{11}$—an isomer of cane sugar. By hydrolysis it forms $C_6H_{12}O_6$ (Laevolose.) Triticin is an amorphous, tasteless and odorless, white powder, very deliquescent.

Bermuda grass was investigated chemically by Semmola (1841), who separated cynodin, which according to Flückiger and Hanbury is probably asparagin.

Undoubtedly with the onset of the present war and the cutting off of exports from Central Europe, our supply of Triticum has come largely from France and Southern Europe. As Bermuda grass rhizome is generally recognized there as equivalent to, if not better than couch grass rhizome, it is not to be wondered at that quantities of the former were sent to our markets as a substitute for the latter, especially in view of the fact that couch grass rhizome had, meantime, increased enormously in value.

With the detection of this substitution by our Government authorities and the warning issued to exporters and importers, we will probably not be troubled again with this substitution.

SUMMARY.

Historically—Probably the rhizomes of both of these grasses have been employed medicinally since the times of Dioscorides and Galen. To-day, couch grass is recognized in the pharmacopoeias of the United States, Great Britain, Belgium, France, Austria Hungary and Switzerland, while Bermuda grass is official in the pharmacopoeias of Mexico, Spain and Portugal.

Botanically—The plants yielding couch grass and Bermuda grass differ quite widely, not only in size and the size of the leaves and flower cluster but also in the shape of the flower cluster and in other more minute botanical features.

Pharmacognostically—Bermuda grass is rather stouter, though the actual average diameter of the rhizomes is but slightly greater than that of the coarser lots of couch grass. Because of the starch present in Bermuda grass the cut surfaces are whiter and more solid in appearance and the pieces not so straw-like as are those of couch grass. However, nearly all the pieces of Bermuda grass do contain a hollow pith.

Histologically—The differences between the two rhizomes are pronounced. The Bermuda grass contains in its parenchyma cells much starch which is absent in couch grass. The Bermuda grass contains a larger number and rather coarser bundles than in couch grass. On the other hand, couch grass contains a characteristic endodermis which is not present in Bermuda grass.

Chemically—Couch grass contains triticin about 8 percent, and sugar totaling about 4 percent. Triticin is hydrolyzed to a sugar by heating in aqueous solution to 100°. Bermuda grass contains asparagin.

Therapeutically—Neither of these grass rhizomes possesses pronounced activity. Perhaps as a nutritive demulcent, the decoction of either is of value as a drink in fevers. Probably both possess slight diuretic powers. Couch grass has

come into favor in recent years particularly as of value in irritated and inflamed conditions of the bladder.

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THE APPEARANCE OF A PACKAGE AND ITS CONTENTS AS A FACTOR IN MERCHANDIZING.*

BY F. W. NITARDY.

When a stranger is introduced to us, we usually form an opinion of his or her general qualities, as a result of impressions made by the individual and recorded by our various senses. As the impressions made through our sense of sight are the easiest recorded and remembered, it is quite logical that first impression is based largely on appearance, hence the saying "clothes make the man." While such first impressions are not always correct, the value of making them favorable is generally recognized.

Similarly should we cause the first impression of merchandise to be favorable, for it is daily introduced, so to speak, to many customers and people coming into or passing the store. They make its acquaintance through the medium of windows, show-cases, or the personal introduction by the salesmen. On making the proper first impression depends to a large degree the volume of new business that can result from the display or showing of goods and when such goods are your own this impression frequently forms the basis by which you and your store are judged. In few lines of business is appearance of more importance than in ours, for quality is not always a visible attribute, especially not in the various medicinal preparations, drugs and chemicals usually packaged by the retailer and daily sold on demand over the counter. It is in these preparations that the character of the Pharmacy

* Read before Section on Commercial Interests, A. Ph. A., Chicago meeting, 1918.

dispensing them is most evident. Yes, reputations have been both made by the careful attention to, and unmade by the neglect of this point.

It is much more difficult than would appear to most of us, to notice any imperfections in our own products. We are not placed in the position of drug store customers enough to get the right viewpoint, and it is especially difficult to enter our own stores and see things as they are seen by the public. We are too familiar with it; we are so used to seeing that we don't see. What other people notice without effort requires our close attention, and a critical eye.

For the purpose of illustrating the principal thought of this paper, let me describe three articles recently purchased in a drug store; they were a 2-oz. bottle of Spirit of Camphor, 1/2 oz. Tincture of Iodine, and a dozen 2-grain Quinine capsules. The Spirit of Camphor had a slight sediment in it, just a bit of dust and such foreign particles as are normally carried into it by the camphor. The bottle was the usual prescription oval stoppered with an ordinary regular length cork; the latter, however, was difficult to remove, for it had been driven in too far, only about 1/4 inch protruding from the neck and this at a decided angle to one side. The label read "*Spts. Camphor;*" it squared better with angle of the cork than with the bottle, and had evidently been slid over the bottle in moist condition, as a streak of paste was visible below the label. The dust of several days' standing had accumulated on the lip of the bottle and the whole appearance was further marred by a price mark in large blue-pencil figures across the label.

The Tincture of Iodine bottle was fitted with too small a cork, permitting the Iodine to come between the neck and cork to within about one-eighth inch of the lip. The label was a regular shop label but a trifle too large for such a small bottle, the upper portion of it being creased somewhat to make it lay down on the shoulder of the bottle. Finger marks of bluish tint indicated that the person applying it had had Iodine on his fingers.

The Quinine capsules were dispensed in a square telescope box with rather loose fitting lid, just loose enough to make the body of the box fall out after the package had been raised about six inches. The capsules themselves seemed to be a home-made product on which the errand boy or apprentice had put in his spare time without requisite supervision. They showed considerable irregularity in filling and a good detective would have found no difficulty in identifying the individual who had handled them, by the finger prints which perspiring hands had left. The box was labeled with the usual stock label having a large white space at the top and a small imprint giving the name of the store at the bottom, and on this white space appeared "2 gr. Quinine Caps." in lead pencil writing.

I doubt if you will have to draw on your imagination to visualize the trio just described; your memory will probably recall drug store packages fitting the description given.

How much more would the customer think of its quality had the Spirit of Camphor been filtered, and how much better would be the first impression if the cork was of proper length, straight, and not driven too far into the bottle? How valuable would be the evidence of care shown by a straight and correct label and clean bottle? The paste or mucilage could have been removed with a wet

cloth before the bottle was put in stock and the lip could have been protected by a paper cap so that dust could not have lodged at this particular point.

We all know how Iodine will corrode a cork. If you have ever had a cork stoppered bottle of Iodine that had been in the house for some time, tip over on a nicely white enameled shelf in your bathroon, you will realize how much damage can be done by a corroded cork. Would it not be better to use a rubber stopper and prevent such annoying accidents for your customers?

The cheapest help can fill Quinine capsules providing it is carefully instructed. Capsules unevenly filled, bearing finger marks, or traces of Quinine on the outside are not a particularly good advertisement.

A box with a properly fitted cover or lid is no more expensive than one with a poorly fitting lid; it is just a question of proper attention at the time of purchase. The label, too, could be improved by having it typewritten or printed, and adding directions as to how often and how many may be taken.

The Spirit of Camphor label previously referred to is a relic of the time when printing houses knowing nothing about Pharmacy constructed the labels for the druggist. Unnecessary abbreviations on labels should be avoided, incorrect titles are inexcusable, and bad English in their reading matter will hardly serve to prove our being professional men.

When you get back to your stores, just look over your stock of shop labels. I am sure most of you can find on them some statements that you never knew existed. Some years ago I found a quantity of Tincture of Nux Vomica labels in use which gave an antidote that would properly have fitted for a Tincture Opium label, a rather serious error.

In dispensing liquids generally, it is a good policy to filter them, even such things as Olive Oil, Turpentine, and certain liquids which are intended for technical purposes should be filtered before being bottled. While in many cases, it may not make the product any better, it will improve its appearance and thereby leave a better impression with your customer. A little care and judgment exercised in corking bottles will work wonders as will also the use of a moist cloth on the finished package and labels placed straight and at uniform height. If any price marks are necessary, they should not mar the label. Price stickers are inexpensive and make a package look much better and if paced at the bottom of the bottle, do not remind the customer continuously of the money spent. Let him forget the price and remember the quality. The convenience of the customer should be considered in designing or selecting the package for any article. A viscid liquid in a narrow mouthed bottle or a hygroscopic salt in a paper container will only serve to vex your customer and make him try another store.

One could go on indefinitely with descriptions of improper packages and enumerate many little points that should be observed, but what has been said is sufficient to convey the idea that you may find some food for thought by carefully scrutinizing packages from your own and other stores. Make the appearance of both package and contents an ad and asset for your store by studying their qualities and faults from every angle and then make the changes you deem necessary. I am not advocating extravagance. One can often create a great improvement in the appearance of both package and product without expense.

REPETITION MAKES REPUTATION.*

BY W. W. FIGGIS.

I submit that the constant *repetition* of any fixed course of procedure establishes a *reputation* which is calculated either to inspire confidence or create suspicion.

The continued repetition of a short-sighted policy earns a reputation which is inimical to business building, until the very atmosphere of one's store is permeated with that indefinable something, which repels rather than draws trade.

The man of broad vision, who works on the basis that "A pound of taffy is worth a ton of epitaph(y)," and meets his customers, also trains his clerks to approach prospective buyers, with that genial smile which betokens an honest, good-natured disposition, always wins and holds trade.

I stated last year in a "paper" before this Association, that "satisfied customers are a permanent asset," and now I would add, that they also constitute a continuous advertisement, and this constant repetition has a reflex influence constructively, in relation to the reputation of any store.

The reverse is also true, that dissatisfied customers are a permanent liability with a steadily increasing penalty, which works destructively, because people will talk of the treatment they receive, and it is impossible to nullify the cumulative effect of one's words when once spoken.

It is generally conceded that our mental attitude has everything to do with what we expect to accomplish, and when we consider the psychological fact, "As a man thinketh, so is he,"—and this being purely a mental operation, it must necessarily be a process of transformation rather than one of reformation.

Let us apply this principle to a changed policy which is obviously essential in the conduct of some store, to improve conditions, and increase sales and profits. The stereotyped custom in such a case, is usually the adoption of some new system of sales adjustment, which is a process of reformation, whereas the correct starting point, I claim, should be psychological, and the procedure one of transformation: in other words, from the "ego" of the individual, which is the source of his personality, and the origin of his thoughts, volitions and actions, and the seat of character.

To be more specific—we might as well be perfectly frank regarding this very important phase of the subject, because there is no gain in "patting one's self on the back," and placing the blame for a shrinkage in sales where it does not belong, when, as a matter of fact, the trouble may originate in the Proprietor himself, because his reputation is being impaired by the repetition of certain acts, due to some deterrent peculiarity of his disposition, of which he may not be aware, therefore over which he cannot exercise control.

This unfortunate trait may be perfectly apparent to others, and, under these circumstances, if he should criticise some clerk in his employ, such might justly reply, "What you are speaks so loud I cannot hear what you say."

It is axiomatic that we become like those with whom we are closely associated, and clerks therefore, even unconsciously, take the cue from their employers, because where the engine goes the cars usually follow; therefore we are confronted

* Read before Section on Commercial Interests, A. Ph. A., Chicago meeting, 1918.

with a double reason, why the necessary remedy to improve conditions should be promptly applied.

I submit that the mode of procedure is, that the Proprietor should begin with himself, and by introspection, and a systematic process of self-examination, discover, that possibly an altered mental attitude, and a readjustment of his disposition is necessary to remove the hindering cause, to the perfect harmonizing of his personality with the individual peculiarities of his customers.

It is worthy of note in this connection that "Bradstreet's" recent report states, that "Four-fifths of all business failures result from tendencies present within the individual himself, and the remaining one-fifth is due to extraneous conditions, over which he has little or no control."

For this reason, it is very important to be fully convinced, that all reconstructive business policies should begin with a transformation of "self" as the starting point; secondly—with the clerks in our employ; and lastly, with whatever reformation may be thought necessary for the further successful conduct of the store.

Let us again approach this subject from another angle. It can be logically proven, that habit is the automatic working of memory—in other words, remembering to do something so often, that unconsciously the process lapses into a habit, and it follows as a reasonable conclusion, that if you are inclined to be a pessimist, and see only the "hole in the doughnut" to the exclusion of the complete article, this unfortunate mental attitude can be overcome, if you will continuously remember to cultivate a cheerful and contented disposition, which, by reason of repetition, unconsciously becomes a habit; and establishes a new reputation, because it has become part of the warp and woof of your personality.

We all know that a good-natured disposition, if sincere, is infectious as well as contagious—who of us has not felt the exhilarating uplift of such a personality, and endeavored to reproduce the type, and made a dismal failure of it, because we neglected to grasp the fact, that its Genesis was from within, as an active principle, and not a veneer, nor an assumed mannerism, but the spontaneous outworking of the inner self.

The rose and the onion both grow side by side in the same soil, and both draw from the same source of supply, but how different is the finished product, and we all have it within our power to extract from life's environment what constitutes the fundamental basis of our dispositions.

The repetition of a determination, to expect a silver lining to every cloud, establishes a reputation which enables us, the better to achieve life's objectives—as the song has it "What's the use of worrying, it never was worth while, so pack up your troubles in your kit-bag and smile, smile, smile." But we should not lose sight of the fact that excessive frivolity is to be deprecated as puerile and unbecoming in any man.

We are surrounded by innumerable illustrations of the fact that all true progress is a process of transformation. Is not evolution calling in clarion tones—"I work from within." Does not the surgeon, when necessary, insert a seton in a wound, in order to keep it open, and give nature time to begin her work of healing from the inside. Are not our physical bodies sustained by the building up of tissue on the inside, to compensate for the "sluffing off" process, which we are

told takes place on the outside; but I will not weary you with further illustrations, because the fact is self-evident.

Accepting what I have endeavored to prove as true that repetition makes reputation—transformation should precede reformation and that all true growth and progress should begin from the center and extend to the utmost periphery of one's sphere of influence. The next logical step is into the realm of "efficiency," with all that it suggests for scholarly attainment, and business acumen.

This word "Efficiency" has a magic charm for the red-blooded man who is fully alive to the possibilities of achieving larger successes than those already accomplished; and is a tonic for further effort along definite lines for larger attainment, realizing, that the "Mill will never grind with the waters that are passed," he is always on the alert for anything, and everything of practical value, which tends toward a healthy material growth, and enlarges his scope of possible endeavor.

Self complacency is the foe of progress, and a garrulous disposition the enemy of efficiency. We should learn to think twice before we speak once, because it has been well said that "A glib tongue often betokens a cracked brain," just as a smell of gas reveals a leak in the pipe.

To interject a little mirth into this paper, I am reminded of a story regarding "Efficiency." A youthful hopeful of some ten summers looked up into his father's face from a book he was reading and inquired,—"Papa, what is Efficiency?" "Why, my son, that word-means 'doing or saying precisely the right thing at precisely the right time.'" "O!" exclaimed the young hopeful, "Then I was efficient last night when I rolled Johnny over into my place in the bed, just before Ma came in with the castor oil, and back again before she came to the other side of the bed."

The spirit back of all effort reflects the results obtained. To such a man yesterday's best does not suffice for to-day, because anyone who rests on past achievements, sooner or later reaches the "Angle of repose," and becomes mentally inert and atrophied.

A wishbone can never be substituted for a backbone, and the man who can only cut prices in a last spasm to make sales, had better sell out and give another fellow a chance to demonstrate that the secret of success is having the correct viewpoint, and therefore he eliminates all fossil habits and puts into action aggressiveness mixed with caution, and optimism combined with horse-sense, plus that telescopic vision, which is measured by knowing an opportunity when it presents itself, and his ability to seize it before it is gone.

In conclusion, let me suggest that there never was a time when the opportunities for enlarged spheres of activity were more advantageous than now, the changing times, and the enforced differences of tastes, coupled with the consequent varying needs of the general public makes it opportune to put more "pep" into your business, and interject more individuality and originality into the conduct of your store, remembering the trite saying that "Wherever McGregor sits is the head of the table."

SECTION ON HISTORICAL PHARMACY, AMERICAN PHARMACEUTICAL ASSOCIATION.*

ABSTRACT OF THE MINUTES OF THE SESSION HELD IN CHICAGO, ILL., AUGUST 15, 1918.

The session of the Section on Historical Pharmacy of the Sixty-sixth Annual Convention of the American Pharmaceutical Association was convened by Chairman L. E. Sayre in Congress Hotel, Chicago, August 15, at 9.30 A.M. The Chairman read the following address:

ADDRESS OF CHAIRMAN L. E. SAYRE.

EARLY HISTORY OF BIOLOGICAL PRODUCTS.[1]

SMALLPOX VACCINE.

The oldest form of biologic treatment is prophylactic immunization to smallpox. Reports of smallpox epidemics are found in the Chinese literature as early as the fourth century, and the idea of protective inoculation seems to have developed in China during the fifteenth century but not to have spread beyond its boundaries until some time in the eighteenth century, when it found its way into Japan and other eastern countries. It was introduced into England from Turkey by the wife of the British Ambassador to the latter country late in the eighteenth century.

The relationship between cowpox and smallpox and the protection against smallpox resulting from accidental inoculation with cowpox, appears to have been recognized as early as 1753. The first deliberate application of cowpox virus recorded was by a farmer, Benjamin Jesley, in 1774. Other sporadic experiments of this nature were made but no one seems to have attached any real significance to the observation or to have recognized its possibilities prior to the investigations of Jenner.

Dairy workers directed to Jenner's attention the fact that milkers who contracted cowpox inoculations from the udders of infected cows, were subsequently immune to smallpox. He collected data on 16 cases with histories of accidental cowpox inoculations in whom subsequent inoculations with smallpox virus were negative. Supported by the advice of John Hunter, probably the greatest medical student of the eighteenth century, Jenner determined to try this method of immunization. He accordingly vaccinated an eight-year old boy from a cowpox vesicle on the hand of a dairy maid. The inoculation ran the characteristic course, and six weeks later Jenner attempted unsuccessfully to inoculate the boy with smallpox. Jenner published the report of this case, along with the data previously collected, and brought upon his head a storm of criticism, abuse and ridicule. He persisted in his experiments, however, and in the course of a few years convinced some of the broader minded medical men and scientists of the truth of his theory.

Vaccination with cowpox virus now spread rapidly, not only throughout England, but to the continent, and was introduced into the United States in the very beginning of the nineteenth century. The first vaccination in America was done by Dr. Benjamin Waterhouse, of Boston, on his own son in July 1800.

It is difficult for us at this time to appreciate what vaccination has meant to the world. It is necessary to bear in mind that up to the beginning of the nineteenth century smallpox was the most widely disseminated and dreaded disease to which the human race was heir. Practically everyone had it sooner or later, and from a thirteenth to a fourteenth of each generation died of smallpox.

Aside from this appalling toll of lives the disease left in its wake a population with scarred faces, blind eyes and numerous other serious afflictions. In the early work on vaccination it was customary to use very largely "humanized lymph." Patients were inoculated with cowpox material and from these original inoculations "arm to arm" vaccination was carried out. This procedure is still used in certain countries, notably, Mexico, but is objectionable because

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* Papers with discussions thereon will be printed apart from the Minutes.

[1] Assistance in preparation of this article was rendered by the biologist of the laboratory of Parke, Davis & Co., to whom the author expresses hearty thanks.—L. E. S.

of the possibility of transmitting disease, especially syphilis. Most countries used exclusively virus from animal sources, and "arm to arm" vaccination is illegal in many countries, as it should be.

ANTITOXIN.

The scientific treatment of a disease must be preceded by the study of its pathology. This is very well exemplified by the discovery of antitoxin which followed a series of investigations, each of which formed a necessary link in the chain. Only brief references need be made to the fundamental work of Louis Pasteur on the relationship of microörganisms to the cause of disease, and the extension of this work by Koch and his pupils. These early investigations constituted the foundations of bacteriology and immunology.

Two general ideas or explanations developed early in the study of immunity, the one dominated by the idea that body fluids are chiefly concerned, and the other attributing the most important action to the cells, especially leucocytes. The latter view, or "cellular hypothesis," had for its chief supporter, Metchnikof. On the work of Metchnikof, and his school, is based the theory of phagocytosis. According to this view, immunity depends on the activity of the phagocytic leucocytes which have the ability to engulf the microörganisms and destroy them.

Another group of workers devoted their attention mainly to body fluids, including the blood serum and in the course of these investigations it was ascertained that blood serum has certain bactericidal properties of a specific character. It was further observed that serum of naturally immune animals had in most cases a higher bactericidal action than the serum of susceptible animals.

The next important step was the observation of Nissen and Behring (1888–89) that serum of artificially immunized animals possessed this bactericidal property in a very marked degree. In studying cases of acquired immunity it was further noted that in certain of them no bactericidal substances were demonstrable in the body fluids, and this observation ultimately resulted in the discovery of antitoxic immunity.

The cause of diphtheria (*Bacterium diphtheriae*) had been discovered a few years before by Klebs and Loeffler (1884). Roux and Yersin in 1888 obtained diphtheria toxin by filtering the organisms from broth cultures of the diphtheria bacillus.

These various researches had paved the way for the discovery of antitoxin, and in 1890 Behring and Kitasato announced the discovery that an animal, immunized against tetanus or diphtheria, produces in its blood substances capable of neutralizing the poison (toxin) elaborated by the specific microörganisms, and that the blood serum of such immunized animals, injected into other animals, would protect them against otherwise fatal doses of this toxin.

During the next three years favorable reports on the serum treatment of diphtheria were made by Kossel, Behring and Boer, Schupert and Canon, Katz and Bogenski, Huebner, Ehrlich and Wassermann. It was not, however, until the remarkable work of Roux of the Pasteur Institute, in Paris, that the antitoxin treatment of diphtheria was really established on a stable basis.

In October 1894 the International Congress of Hygiene met at Budapest to consider the various subjects relating to the welfare of the human family. This Congress will always be memorable as there was presented to a doubting World the final proofs of the possibility of immunizing animals against diphtheria by means of the toxic substances formed by these germs when grown in the laboratory. It was a great victory for the science of bacteriology, which had received so severe a set-back four years previously, through the failure of the much vaunted tuberculin brought to the attention of the Medical Public for the treatment of tuberculosis by Koch.

On the second day of the Congress, Roux of France, and Aronstrom of Austria, and on the third day Behring of Germany presented papers on this subject. In many respects the most important paper was the first mentioned, as it gave exhaustive and conclusive data showing that the new remedy could be expected to reduce the death rate from diphtheria to at least one-half of that expected. A good many American workers attended this Congress and brought home with them a little of the antitoxin, but more especially enthusiasm and belief that the key for unlocking the secret of combating the infectious diseases had been found. It was the climax of nearly ten years' work which had been inaugurated by the epoch-making but almost

forgotten work of an American physician, Dr. Henry Sewall, of the University of Michigan, who was able to show the possibilities of immunizing pigeons against rattle snake poison. Unfortunately, on account of poor health, Dr. Sewall was obliged to discontinue his work and seek the health-giving climate of Colorado, where he has since devoted his energies to the practice of medicine.

Roux's observations were based on the serum treatment of 488 children. Among these there were 109 deaths, a mortality rate of a little more than 24 percent, whereas, during the years of 1890–1893, 3971 patients in the same institution suffering from diphtheria and not receiving antitoxin had a mortality of 51 percent. During the same year that Roux had treated these 488 cases with antitoxin 520 other children in another hospital in Paris in which antitoxin was not employed showed a mortality of 61 percent. This remarkable reduction in the fatality of the disease based on such an extensive series of cases, awakened world-wide interest, and for the first time serum treatment of diphtheria was seriously considered.

As soon as those attending the Budapest Congress reached home they discussed the subject of serum therapy with their friends and co-workers, the result being that immediately it was realized that there would be a demand for diphtheria antitoxin for the treatment of the most dreaded infectious disease, which, up to this time, was regarded as the most fatal infection with which physicians were called upon to combat. It was expected that practically one-half the patients treated, no matter by what method, would succumb. Furthermore, it had the reputation of killing more doctors and nurses than any other disease which they were called upon to handle.

Parke, Davis & Company, of Detroit, Michigan, New York City Board of Health, H. K. Mulford & Company, Philadelphia, and the Marine Hospital Service, I believe, in Washington, each immediately commenced organizing a laboratory suitable for developing serum. Within a couple of months horses were being treated for the production of the new serum. By February or March sufficient American serum had been produced for experimental purposes. In the meantime, a very small quantity of the product had been obtained from Germany or France.

The development of antitoxin at that time was a slow procedure as biologists did not understand the intensive methods of toxin immunization now generally employed. The average length of treatment of a horse serum before the antitoxin was utilized was a year, so that a period of two years elapsed before any considerable amount of American produced serum was available.

The serum treatment of diphtheria made slow headway during these early years, being less popular in America than it was in Europe. Reviewing the literature from 1895 to 1900 we find various articles assailing the value of serum treatment, and advocating in preference the so-called "antiseptic treatment" of diphtheria. Accumulated evidence gradually broke down this prejudice and by 1900 the great majority of physicians accepted the value of antitoxin treatment.

Gradually physicians and the general public became convinced that the new agent was indeed all that was claimed for it, and the death rate from diphtheria dropped to one-half, and steadily declined thereafter until probably it does not, or should not exceed 5 percent if the serum is properly and promptly used at the beginning of the disease.

In 1898 Behring, to the astonishment of both the medical profession and serum producers of this country, was granted a patent in the United States on antitoxin. Behring had been endeavoring for three years to obtain such a patent with a spirit entirely foreign to all scientific principles or medical ethics, and in keeping with the type of Prussianism we have become familiar with in recent years. American laboratories had spent several years in developing their facilities for antitoxin production, and were supplying at lower prices, antitoxin of higher potency than the German product.

This patent, if allowed to stand, would have placed the medical profession and suffering humanity of America at the mercy of a single German manufacturer who had already shown unmistakable evidence of cupidity and avarice. A storm of protest arose throughout the country. State and National medical societies passed resolutions against the tolerance of this mercenary gouging, and prominent Medical Journals took up the fight. Parke, Davis & Company, one of the first commercial producers of antitoxin in America, announced their willingness to bear the brunt of any litigation which might develop through the use of their antitoxin, continued to supply the product, and insured protection to its users. The German producers cowed by the evidence

of public sentiment never tried to defend their patent, and the production and distribution of antitoxin in the United States proceeded unhampered.

About 1898 antitetanic serum was brought out as an analogous remedy for the treatment of lockjaw, but it was soon found, not alone by laboratory methods, but at the bedside, that it could not compare with diphtheria antitoxin as a treatment for the disease. As someone has remarked, symptoms of tetanus which come on a week or more after the infection which produces it, are symptoms of death, and the patient receives the antitoxin too late to exhibit its fullest efficiency. It was soon shown, however, that it possessed marvelous value as a prophylactic when given at the time the wounds were made which resulted in the production of tetanus. The recognition of the value of the serum for this purpose has steadily increased until at this time the world is convinced that it is the most successful agent for preventing disastrous results following Fourth of July accidents, and eliminating the fearful disease that has ever attended wars, millions of doses being used during the present conflict, it being the custom to administer it to every wounded man as promptly as possible after the wound has been received.

OTHER SERA.

Successful results obtained from the use of diphtheria and tetanus antitoxin naturally stimulated early attempts to apply the same principle to other types of infection. Antistreptococcic serum was developed in 1903, antimeningococcic serum in 1906, and antigonococcic serum in 1907.

Various attempts have been made to develop serum treatments for pneumonia and tuberculosis, but with only a limited degree of success. The early antipneumococcic serums were worthless, but it has been shown in recent years that there are several types of pneumococcus, and that serum to be of value must be specific for the particular type involved, and that all types are not amenable to serum therapy. The best known antitubercular serums are those developed in 1903 by Marmorek and in 1906 by Maraglino. It is pretty well accepted at present that serum therapy in tuberculosis is of little or no value.

Serum therapy has also been attempted with varying degrees of success in a number of other conditions—such as staphylococcic infections, Asiatic cholera, bubonic plague, blackleg, and several other diseases.

VACCINES.

The possibility of vaccination with bacterial products was discovered by Pasteur in 1870 while working with cultures of chicken cholera. He observed that cultures which had lost their virulence were still capable of immunizing fowls, and was quick to grasp the significance of this fact. Shortly after Pasteur developed a prophylactic vaccine against anthrax, which is still used to a considerable extent, although the "spore vaccine" subsequently developed is somewhat more efficient.

In 1880 Pasteur started his epoch-making work on rabies developing what was subsequently known as the Pasteur treatment for the preventive immunization of individuals who had been bitten by rabid animals. Subsequently he successfully prepared prophylactic vaccines for swine erysipelas, blackleg, and rinderpest.

During the year 1898 and 1899 extensive application of bacterial vaccines was made in the prophylaxic of cholera, bubonic plague, dysentery and typhoid.

Prophylactic vaccination against cholera was introduced by Haffkine in 1899. It was extensively used in Japan in 1902 during a severe epidemic of cholera which prevailed there at that time, and resulted in a marked reduction, both of the case incidence and mortality of the disease. The most successful application of cholera vaccine, however, was made in the Philippine Islands a few years ago by Dr. Richard Strong, of the United States Public Health Service, who used a vaccine prepared according to his own formula. Strong has subsequently used the same type of vaccine in the Red Cross work in Serbia.

The pioneer work on "plague" vaccine was also done by Haffkine, in 1899.

The most extensive and successful application of dysentery vaccine has been in Japan based on the work of Shiga, in 1898.

Prophylactic vaccine against typhoid was introduced by Wright and Leishman in India in 1898. It was later used in the British Army during the Boer War. The wonderful developments of typhoid vaccine during subsequent years, and its importance in the control of typhoid fever in military and civil life are so well known as to require no discussion.

The use of bacterial vaccines on a therapeutic basis dates to the work of Wright and Douglas on opsonins, in 1903. Such vaccines have subsequently been applied with success to a great variety of infectious conditions proving especially efficient in infections of a chronic or subacute nature.

TUBERCULINS.

Reference has already been made to the unsuccessful attempts to work out an efficient method of serum treatment for tuberculosis. In 1890 Koch announced the discovery of tuberculin and great hopes were entertained for the success of this therapy. Koch recognized, however, that this agent had only limited possibilities and needed to be used with extreme caution. He did not by any means regard it as a specific in the sense that antitoxin is specific for diphtheria.

Regardless of the caution urged by Koch tuberculin was used in an irrational manner by the great majority of physicians, and the results were not only disappointing but hundreds of tubercular subjects were prematurely sent to their graves. The reaction from this "tuberculin delirium" resulted in wide-spread skepticism from which the medical world is just now emerging. We now know that tuberculin intelligently applied is a valuable diagnostic and therapeutic agent, but that it is not a "cure-all," and that its successful use demands knowledge and caution.

The prominent place attributed to glandular therapeutics during recent years has perhaps given the impression that this line of treatment is of new development. It is true that little was known of certain of these glands, notably, the pituitary and pineal, prior to the research of the last decade. The idea of using animal derivatives, however, is one of the oldest of our therapeutic conceptions.

Medical literature 600 B.C. contained references to the use of testicular extracts. At about the same time such animal derivatives as swine's fat, hair of a virgin goat, and human bone were employed. These agencies were used, however, with the idea that their vile tastes and odors would drive away the offending disease. The modern use of glandular derivatives on the other hand is based on the knowledge that in these tissues chemical substances are elaborated and stored up which profoundly influence the functional activity of the body.

The rational use of glandular derivatives is only about 25 years old. The first serious study of ductless gland action was that of Reverdin and Kocher in 1883 who published the results of their observations upon patients from whom thyroid glands had been removed. This stimulated a series of researches which resulted in the establishing of the relationship between the thyroid gland and certain definite diseases, such as cretinism. The use of thyroid gland in the treatment of these deficiency diseases soon followed, and proved to be one of the most successful applications of glandular treatment that has ever been developed. In fact, conversion of a cretin into a normal individual through thyroid feeding is one of the miracles of medicine.

Clinical reports based on the use of ovarian preparations date back to 1904, although it was only in more recent years that the real possibilities from the use of such preparations were clearly understood. Ovarian treatment is now regarded as the one efficient means of dealing with the disturbances incidental to both artificial and natural menopause.

Oliver and Shäfer made the important discovery that extracts of the medullary portion of the suprarenal gland when injected intravenously produced a marked rise in blood pressure. This led to the discovery by Takamine of adrenalin, the active principle of the suprarenal, a product well known to every pharmacist.

Brown-Sequard, in 1889, carried out clinical experiments with testicular extracts, which, while having only a limited value "per se," stimulated interest in the possibilities of glandular treatment.

Preparations of the thymus have been used therapeutically for quite a number of years, but the developments in therapeutic application of the parathyroid gland, pineal gland and pituitary gland are of more recent development. Of these latter, the pituitary is by far the most important in biologic therapy. The extract of the posterior lobe of the pituitary (pituitrin) has practically revolutionized the practice of obstetrics. It is by far the most efficient oxytocic agent that has ever been developed, and intelligently employed constitutes a safe method of shortening the duration of labor and decreasing the necessity for instrumental deliveries. The anterior lobe of the pituitary is used in certain growth disturbances.

There are a number of other glands which have been used more or less therapeutically,

but in this fleeting consideration we can do no more than to touch on those which are known to be of definite importance.

Secretary Hugo Kantrowitz read the program for the session. The report of the Historian was presented by E. G. Eberle.

REPORT OF THE HISTORIAN.

FELLOW MEMBERS:

Another year has been added to the records of the American Pharmaceutical Association and pharmacy, notwithstanding that its service has not been recognized by the Government as a profession, the products of pharmacy made possible by pharmacists have an important place in the war, where death, injury and disease are ever present. Without aspiring for undeserved recognition it can be said with no possibility of contradiction that the reliable drug supply for our soldiers has been made possible by the years of persistent and devoted study of the materia medica and its preparations by pharmacists and largely under the direction of the American Pharmaceutical Association. The splendid coöperation of pharmacy and pharmacists under conditions that did not offer desired encouragement exhibits their loyalty to the country under any and all conditions. When the history of the war is written medicine will be accredited with all the achievements to which it is justly entitled, and certainly no more heroic or patriotic votaries ever engaged in a country's service—but will the work that pharmacy and pharmacists have contributed be given deserved credit? Will it ever be admitted that the fine medical service was, in part, made possible by pharmaceutical manufacture and, if organized pharmaceutical service had been provided, still better service would have been given our soldiers? I am reminded of a newspaper article in which the bravery of the surgeons was indicated by the headlines and pharmacists not at all mentioned, whereas the whole half column of news items spoke practically only of the brave acts of pharmacists.

To me, among the grandest words I ever read are: "Quentin's mother and I are very glad that he got to the front and had the chance to render some service to his country."

That after all is the thing worth while—to render service to the country, to the world, in this trial of humanity. We are first and above all citizens, and there is our whole duty, but it is not immodest to have pride in our profession, which is engaged for service to humanity, and aspire to its greater service by being accredited with some degree of rank.

History is being recorded at each of our various sessions and Sections, and later it will be written. Space was offered us at the Smithsonian Institution for exhibition of historical matter. There seems to be little in the possession of the Association that would make a creditable display. Since the writer took charge of historical matter all has been made up of photographs, sketches, a few badges, books, programs, etc. These cannot of course be displayed to advantage.

There are in most schools original or first products of many chemicals, apparatus, etc., that in many instances are in the way and which if of historical association could be utilized for such display. Whether there is available material at the Lloyd Library I do not know. I hope to have a meeting here in Chicago with the Committee appointed for securing such material. Last year we had a nice display at Indianapolis, but largely of local interest; still there were a few items that might be acceptable and Mr. E. G. Eberhardt expressed his opinion that some of the articles could be had, either as loan or donation. This year we doubtless will have an interesting display, and I now make the same suggestion as last year, that wherever we may meet an historical exhibit be provided. These displays bring us into contact with those who promoted pharmacy and this Association.

During the year we have received many additional photographs, sketches and clippings, all of which are filed and are recorded on the attached sheets.

As far as my records go we have had 26 deaths since last we met. They are:

Dr. John C. Otis, Cincinnati, Ohio.
John S. Muth, Baltimore, Md.
Dr. Kirkland, Los Angeles, Cal.
Prof. Charles Caspari, Jr., Baltimore, Md.
S. E. R. Hassinger, Philadelphia, Pa.
Hugo L. Boyd, Kosciusko, Miss.
President Charles Holzhauer, Newark, N. J.
Prof. Joseph P. Remington, Philadelphia, Pa.
John F. Fischner, Chicago, Ill.
Charles T. George, Harrisburg, Pa.
E. A. McFadden, Hackensack, N. J.
George Weldon, Paris, Idaho.
Dr. Alfred Birch Huested, Delmar, N. Y.
Ferdinand C. Schapper, Chicago, Ill.

Samuel Mansfield, Baltimore, Md.
Charles J. Shulmyer, Providence, R. I.
E. P. Correll, Eureka, Cal.
Max Morris, Macon, Ga.
Henry Maisch, Baltimore, Md.
Rudolph Fack, Cincinnati, Ohio.
W. F. Jackman, Detroit, Mich.
George Leis, Lawrence, Kansas.
W. L. Dewoody, Pine Bluff, Ark.
Prof. Geo. D. Timmons, Valparaiso, Ind.
Charles F. Dare, Bridgeton, N. J.

Among them an ex-president, a president, an honorary president, a long-time faithful secretary and many devoted active members. Doctor Otis passed away just before our last meeting, Professor Remington lived to the first day of this year, and Professor Timmons entered the unseen temple last month. These twenty-six members represented 574 years of service in the American Pharmaceutical Association, an average of twenty-two years for each. The oldest in years of membership was Professor Remington, 51 years; the oldest in age, Dr. A. B. Huested, born in 1840. Over half of the number had been members for twenty years or more. I suggest that we rise in memory of these faithful members who have ceased their labors here.

Each year some of our members go away from us and we lose the joy of their companionship, the profit of their valuable counsel and comfort of their examples. But such is history, we contemplate upon our loss and, while we reflect, there is growing up another generation who have profited by their experience and who in turn may look upon us as exemplars. So, though we are saddened and sorrowful because of the loss of our friends and associates, let us rejoice that others representing new life and energy are coming among us. The purposes of our organization have been tried and have stood the test of honest endeavor and devotion to the service of humanity. Let us believe in the Association heart and soul, be optimistic relative to its mission and convey assurance of its great purposes to others who are not affiliated.

Thanking you for your confidence in me, and assuring you that I am always glad to be at your service,

Respectfully submitted,

E. G. EBERLE, *Historian.*

The list of photographs, etc., referred to in the Historian's report comprise 17 programs of various associations and occasions; 4 badges, 21 photographs and sketches of members; 8 sketches of members, no photographs accompanying; 423 photographs, and a large number of clippings relating to the associations and drug interests. The list is filed in the records of the Historical Section. It should be stated that Treasurer H. M. Whelpley was a large contributor, and many of the photographs came through him from the Ebert home.

F. L. Lewton, Acting Curator, Division of Medicine, U. S. National Museum, then addressed the Section on

A NATIONAL PHARMACEUTICAL COLLECTION.

The question of collecting and preserving in the United States National Museum at Washington, D. C., such historical objects connected with the beginning and early history of pharmacy in the United States as are now obtainable is one which has received a great deal of thought and consideration by the officials of the Institution.

In 1904 Professor Edward Kremers, Chairman of the American Pharmaceutical Association's Committee on Historical Pharmacy, addressed a communication to the Secretary of the Smithsonian Institution inquiring concerning the advisability of establishing a pharmaceutical section in the Museum. The correspondence on the subject was continued by Dr. Murray Galt Motter when he became chairman of the American Pharmaceutical Association Committee on Proposed Collection at Washington. From the very first the National Museum was anxious to acquire such collections of historical material as were controlled by the American Pharmaceutical Association. However, at that time the new Museum building had not been erected and there was not space in the old building to house the material. It was of course necessary for the matter to be held in abeyance until the new building was completed. At about this time Dr. J. M. Flint, who had been Honorary Curator of the Division of Materia Medica (now the Division of Medicine) since 1881, tendered his resignation. This caused a further delay in the negotiations

with a view to obtaining pharmaceutical material, and no further action appears to have been taken in the matter until January, 1917.

On January 31, 1917, at the request of the President of the Washington Branch of the American Pharmaceutical Association, Mr. F. L. Lewton, Acting Curator of the Division of Medicine, addressed the local branch on "The Opportunity for Developing Historical Pharmacy Collections at the National Museum," and asked for the assistance of the Washington Branch. This address resulted in the appointment of a committee which brought the subject before the Association at the Indianapolis meeting. A committee of the Council was appointed to investigate the facilities of the National Museum for caring for such collections as are the property of the American Pharmaceutical Association, and I understand that a favorable report was made.

It might be well to point out in a brief way what the Division of Medicine has accomplished since its establishment and to say something with reference to the contemplated plans for its development. Soon after the division was established efforts were made to procure a full collection of the materia media of the world. The attempt to obtain a complete collection of the official pharmacopoeias of all nations, met with great success and from these were compiled, for use in the arrangement of the collections, a list of all the articles of the materia medica of the world and the authorized preparations of each. A large amount of drug material had been obtained from the Centennial Exhibition, and great assistance in building up the collections was rendered by Schieffelin & Company, New York City; Parke, Davis & Company, Detroit; McKesson & Robbins, New York; Wallace Brothers, Statesville, North Carolina, *et al.*

For the reason that the general public is not interested in a large series of scientific specimens installed in glass jars it was decided that the greater part of the materia medica collections be installed as a study or reference series, separate from the exhibition material, where it may be consulted by students and others interested in the subject. This separation was made during the present year and at the same time a reclassification of the collections illustrating materia medica according to the best modern classification was begun.

The collections of the Division of Medicine have recently been grouped into four classes: The History of Medicine, Materia Medica, Pharmacy, and Sanitation and Public Hygiene. The classification adopted to illustrate the History of Medicine is intended to show the evolution of the healing arts and includes: Magic Medicine, Psychic Medicine, Physical or External Medicine, Physiological or Internal Medicine, and Preventative Medicine. Objects illustrating the history of Indian, Egyptian, Chinese, Greek and Roman Medicine appear in the order named. The history of medicine in America is presented pictorially in the form of biographical sketches and photographs of prominent medical men since the settlement of Jamestown. This section will be developed by the addition of material illustrating in a simple and brief manner the basic principles of the different schools of medicine.

A number of important accessions to the materia medica collections were obtained during the past fiscal year. Armour and Company of Chicago contributed some fine specimens illustrating the subject of Organotherapy. Fairchild Brothers and Foster of New York City donated material showing the progressive steps in the manufacture of Pepsin. Some exceptionally good specimens of crude vegetable drugs were contributed by Gilpin, Langdon & Company, Inc., of Baltimore Maryland. The museum is indebted to Merck and Company of New York City for specimens of chemicals which were made synthetically, and to the Heyden Chemical Works of New York, New York, for the contribution of specimens of synthetic medicinal chemicals. Frederick Stearns and Company of Detroit, Michigan; Hoffman-LaRoche Chemical Works of New York City, Roessler & Hasslacher Chemical Company of New York City, and the William S. Merrell Chemical Company of Cincinnati, Ohio, also rendered valuable assistance during the past fiscal year by the contribution of material for the materia medica collections. It is proposed to illustrate the development and modern application of serumtherapy, vaccinetherapy, etc., and specimens and charts for this purpose are being prepared for the National Collections. The Section of Sanitation and Public Hygiene has grown slowly and as a beginning there has been illustrated the composition of the human body, with additional exhibits showing the daily income and outgo of foodstuffs and waste products. Coöperation with other Government Departments is already under way in the preparation of exhibit material dealing with subjects already in the public mind, as for example, the prophylaxis against typhoid fever now being practiced by the military forces, etc.

The Section of Pharmacy having been only recently established but very little material has been obtained relative to this subject. The beginning of medicine and pharmacy are so closely co-related that it is nearly impossible to separate one from the other. The classification as given in the beginning of Wooten's Chronicles of Pharmacy is practically the same as that of the Museum's collections arranged to illustrate the history of medicine. Specimens of modern medicinal forms have been promised for the Section of Pharmacy.

A great expansion of the pharmaceutical library has been made through the transfer from the Hygienic Laboratory, Department of the Treasury, of a large number of books and periodicals relating to the subject of pharmacy, etc. Two rooms have been assigned for use as a pharmaceutical library. Shelves have been placed in the rooms, upon which the books are placed and arranged so they can be readily consulted. Desks and chairs will be provided for the use of persons visiting the library.

Now that we have pointed out briefly what has been accomplished by the Division of Medicine, and have mentioned some of the plans for its development, it will be clear that its future success will depend to a greater or less extent upon the coöperation of pharmacists, pharmaceutical manufacturers and pharmaceutical societies and associations. The National Museum is the authorized place of deposit for all objects of natural history, mineralogy, geology, archaeology ethnology, etc., belonging to the Unites States or collected by the Coast and Interior Survey. The Geological Survey, or by any other parties for the government of the United States, when no longer needed for investigations in progress. There is ample space in the National Museum for the collections of the American Pharmaceutical Association, and for this reason it was deemed advisable to have the matter brought to the attention of this Convention. It will also be appropriate at this time to state the conditions under which the exhibit material can be accepted by the Museum. The National Museum would prefer, wherever possible, that specimens be offered as outright gifts, but where this is not desirable or feasible, it will gladly accept as loans or deposits, valuable material. It is customary for loans to be accepted with the understanding that they will be left undisturbed for a year or more, while deposits are usually made for a longer indefinite period. The Museum cannot bind itself to permanently install any exhibit, or to keep any certain assemblage of specimens always exhibited to public view. It can, however, agree to safeguard them and keep them available for examination and study whenever desired. In order to avoid duplication of material, the Museum would request that all exhibits offered it as gifts, loans or deposits, be first arranged for by correspondence, and the submission of a list or inventory giving an idea of the character and quantity of the material offered.

Washington is the mecca to which come, sooner or later, the people of the United States. About 400,000 persons each year visit the National Museum. Should not the precious relics of the beginnings of Pharmacy in this country be placed where all can see and enjoy them?

DISCUSSION.

F. J. WULLING: It seems to me that here is an opportunity which we ought to accept quickly and without question. I say this in a way, observing the question of details, of course.

It seems to me only great profit can grow out of it, for both the American Pharmaceutical Association and also the Institute.

EDWARD KREMERS: I can only say a word in regard to the text that I adopted for my Report of the Committee on Research of the American Pharmaceutical Association, that all things come to them who wait. After having waited many years, I am more than pleased to have the Representative of the National Museum here to-day. For years it seemed impossible to secure the coöperation of the Institute, and when we would approach them, we were told that we would have to wait until the building was completed.

As Historian ten years, I collected a considerable quantity of material, but naturally we had to restrict ourselves to such material as did not occupy very much space, and as the present Historian has told you, the material that he has collected is mostly all small things, such as photographs, sketches, and things of that sort, rather than objects that are very bulky. Now that the National Museum has provided for exhibits, it seems to me that we ought to begin to collect systematically along other lines.

What pleased me more than anything else is the statement made by Mr. Lewton, that the National Museum of Pharmacy is to be placed on an equal footing with Medicine. What can be done along this line has been demonstrated not only by the Museum in London, but also

the Materia Medica collection in Paris and collections elsewhere. So it is about time that the National Museum should fall in line, and it is certainly gratifying that after these many years of waiting we should have a Representative here from the National Museum and we hope they will annually send a representative to the Historical Section meetings of the American Pharmaceutical Association. Possibly some of the officers of the Association may be willing to request that they attend, in order that we may remain in constant touch with them, especially the Historian of the American Pharmaceutical Association.

The following papers were read:

A History of Glassware—Ancient and Modern, by W. W. Figgis.

Reminiscences of the Origin of Laws and Organizations; Origin of Some Pharmaceutical Associations; Recollections of How the First Narcotic Law in Illinois Originated; by Wilhelm Bodemann.

Pharmacologic Assaying, Historical and Descriptive, by Herbert C. Hamilton.

The Chairman appointed the following Nominating Committee: E. G. Eberle, John G. Godding and Edward Kremers.

Next followed an address on Ebert, Hallberg and Oldberg, illustrated by lantern slides, by H. M. Whelpley. The speaker denominated the address "a talk;" it was far more; during many years of association with the subjects he had learned to know them intimately, and he spoke largely from such intimate knowledge of their personal traits and qualities.

The Historian stated that the Historical Section was growing more interesting each year and that the program of this session was replete with interesting papers and addresses. He suggested that hereafter there should be two sessions instead of one.

Chairman Sayre advised that another session of the Section would be held at 2.30 P.M.

SECOND SESSION.

Chairman L. E. Sayre called the second session of the Section on Historical Pharmacy to order at 2.30 P.M.

General Secretary William B. Day reported on the historical exhibit in the Association rooms of the Hotel. The interest of the members was shown by the many visitors. A list of the exhibits follows:

LIST OF THE HISTORICAL EXHIBIT MADE BY THE UNIVERSITY OF ILLINOIS SCHOOL OF PHARMACY.

Publications of the American Pharmaceutical Association:

Proceedings of the A. Ph. A. 1852–1911. (No meeting in 1861); Volumes 1 to 59.

Index to Proceedings of the A. Ph. A., 1851–1902, 1 volume.

Year Book of the A. Ph. A., 1912 to 1916, Volumes 1 to 5.

Bulletin of the A. Ph. A., 1906–1911, Volumes 1 to 6.

Journal of the A. Ph. A., 1912–1917, Volumes 1 to 6.

National Formulary: 1st Edition, 1888; 2nd Edition, 1896; 3rd Edition, 1906; 4th Edition, 1916.

Pharmacopoeia of the United States of America, complete 1820–1910; 1820 (2nd. Ed. 1828), 1830 Philadelphia Ed., 1830 N. Y. Ed., 1840, 1850, 1860, 1870, 1880, 1890, 1900, 1900 Spanish Ed., 1910.

Pharmacopoeia of the Massachusetts Medical Society, Boston, 1808.

The United States Dispensatory, complete Editions 1 to 20, 1833–1918.

Galen's Works, 7 volumes, Venice, 1556.

Sydenham's Opera Medica, Venice, 1762.

Dalecampii Historia Generalis Plantarium, Lugduni, 1587, 2 volumes.

Fauna Suecica, Linnaeus, Stockholm, 1746.

Flora Suecica, Linnaeus, Stockholm, 1745.

Historie Generale des Drouges, Paris, 1735, 2 volumes.

Basilica Chymica, Crollius, Prague, 1608.

The Druggists Manual, compiled by direction of the Philadelphia College of Pharmacy, Philadelphia, 1826.

Medicinal Edict, Prussia, Berlin, 1725.

A Compendious Medical Dictionary, R. Hooper, London, 1799.

Observationum de Aëre et Morleis Epidemicis. Joanne Huxham, London, 1752.

The Elaboratory Laid Open, or the Secrets of Modern Chemistry and Pharmacy Revealed, London, 1758.

Pharmacopoeia Edinburgensis, 3rd Edition, London, 1737.

The Universal Medicine, or the Virtues of the Magneticall on Antimoniall Cups, John Evans, London, 1642.

Chicago Pharmaceutical Collection:

Prescription Book, 1849.

Recipe Book.

I. Ph. A. Register.

Mementos of A. Ph. A. Convention at Chicago, 1868—Picture of 1868 Meeting.

Mementos of A. Ph. A. Convention at Chicago, 1893.

World's Fair number of Western Druggist (Oct. 1893).

Registration Book at the College Exhibit.

Biroth Picture, Local Secretary 1893.

Ebert Historical Exhibit: Case, Shelf Jars, The Boar, Leech Jar, Balance, Replica, Basrelief, Faculty Picture, Alderman Card, Lecture Notes—1863, Ebert Memorial Vol., Account Book, 1873, Ebert Correspondence, Ebert Diplomas, Ebert Picture (Goodman), Brass Mortar, Revision Committee Picture, Ebert Cup (C. V. D. A.), Counter Balance.

C. P. Wimmer delivered an address, illustrated by lantern slides, on Edward R. Squibb's Lecture Course in Pharmacy, 1869–1871.

The following papers were read:

Note on the Early History of Prescription Scheme Idea, by L. F. Kebler.

Biography of George Leis, by his son, E. R. Leis.

Missouri Pharmacy and the American Pharmaceutical Association, by Mitchell Block.

Charles Holzhauer, by Edward A. Sayre.

The History of the New Jersey Pharmaceutical Association, by Edward A. Sayre.—This contribution brings the History of the New Jersey Pharmaceutical Association up to and inclusive of 1917, and contributed by the same author.

The Nominating Committee reported the following nominees for Section officers:

Chairman—Hugo Kantrowitz, of New York.

Secretary—W. O. Richtmann, of Wisconsin.

They were unanimously elected. The Chairman stated that the Historian was a permanent officer of the Association.

The request was made that an historical exhibit be provided for the New York meeting next year.

The Section on Historical Pharmacy then was adjourned.

PHARMACOLOGICAL ASSAYING.*

HISTORICAL AND DESCRIPTIVE.

BY HERBERT C. HAMILTON.

The first discovery of the value of medicinal substances and their later development was based very largely on pharmacologic observations. During more recent times this has been looked upon as almost the sole means for a rational selection of remedies and for the establishing of correct dosage.

It is only of comparatively recent years, however, that pharmacology has been recognized scientifically as a method of ascertaining the value of a medicinal preparation. For the most part if no chemical method existed for standardizing, entire dependence was placed on the standard methods for extraction and on certain physical tests. Later when it was recognized that a worthless sample of a medicinal drug would make an extract not differing in any apparent respect from one from an active sample, it was very evident that an assay process was a necessity.

Pharmacologic assaying cannot be applied to any drug which induces no typical reaction when administered to an animal or applied to living tissue, and it is unnecessary to apply it to those possessing an active constituent with well marked chemical characteristics. In general, the attitude on this subject is that whenever possible pharmacologic assaying is adapted for such drugs as are not amenable to a chemical assay.

On the other hand, there is the extremist, who voices the opinion of not a few when he says that every medicinal preparation amenable to a pharmacologic test should be so standardized. This, however, is scarcely a logical viewpoint.

The objection voiced against the biological standardization is not against the method as a general proposition but largely against the method in its particular application, that it is qualitative only. There is no question anywhere of the fact that only by animal or human experimentation can the properties of a drug be established. The question is whether the test can be made quantitative and the value of the substance be measured to establish the dosage. It is only of recent years that the therapeutic properties can even occasionally be assumed from the chemical composition. We are still to a certain extent dependent on the natives to suggest the importance of a drug, by the use they make of it—a use based on a more or less accidental observation of its effects on themselves or animals.

As illustration of these points it may be noted that hellebore was discovered to have medicinal properties by Melampe, a shepherd who traced the diarrhoea in his sheep to their having eaten of this plant.

Acetanilid was by accident found to have antipyretic properties by being given to one of Prof. Kussmanka's assistances, causing an alarming lowered temperature.

Many drugs, such as quinine and cocaine, were used by the natives medicinally with no record of their first discovery. In some cases human use followed the observation that animals apparently chose certain plants for relief from injury or disease. These records are, however, not very trustworthy.

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* Presented before Section on Historical Pharmacy, A. Ph. A., Chicago meeting, 1918.

Confining this historical account to those drugs and medicinal substances now commonly standardized by use of animals eliminates much of interest in the history of the materia medica but leaves for consideration some of the most important medicinal substances, *Cannabis Sativa*, Ergot, the heart tonics of the Digitalis series, and the Suprarenal and Pituitary gland extracts.

The writer may be pardoned if he draws somewhat from his own experience, for 19 years of close acquaintance with the actual standardization of the drugs mentioned covers the greatest part of the period during which such standardization in its restricted sense has been practiced.

CANNABIS SATIVA.

Cannabis Sativa, or when grown in India, designated as *Cannabis Indica*, was known and used 1000 years B. C. It may have been the substance referred to under different names, as for example Nepenthe. Its effects are very wonderfully described in Dumas "Count of Monte Christo."

Cannabis Sativa was probably never standardized with any degree of accuracy by use of any other animal than the dog. Fraenkel[1] confirms the experience of most investigators in stating that rabbits are immune to its action. Guinea pigs are also practically without reaction to this drug in any reasonable quantity. Cats are susceptible but are unsatisfactory test animals in many respects.

My personal experience with its physiological assay on dogs began in 1899, but this was merely to continue a practice which had obtained since 1894–5. Houghton,[2] in 1897, read a paper on Physiological Standardization, in which he referred to its use in establishing the reliability of cannabis preparations, but at that time gave no details of the method applied. Twenty-seven samples were assayed, only thirteen of which proved to be active when administered to animals.

One of the first authors to mention the use of dogs and to describe specifically the effect of the drug is Ponthieu,[3] in 1901, who says: "To verify the action of Cannabis Indica the dog is used, and the drug is administered in the form of an extract; its physiological action manifests itself later in a vacillating gait, ataxia, depression of temperature, and finally complete insensibility."[4]

While no accurate description of the assay method originated by Houghton and regularly practiced since, appeared until 1908, a paper by Thomas Maben[5] was read before the Dundee meeting of the British Pharmaceutical Conference in 1902, on the physiological action of *Cannabis Indica*—a paper "based on observations communicated to him in the course of a discussion with H. C. Hamilton," quoted from Proc. A. Ph. A., 1903, page 804.

Famulener and Lyons[6] have recorded the first accurate description of the physiological assay of *Cannabis Indica* including doses of official preparations, characteristic effects, and the end-point to be observed in establishing the value of the drug.

Fraenkel,[1] in an article published the same year, described the action of the drug on dogs, but gave little data on dosage as the samples tested were cannabinol and its derivatives. The work there recorded was qualitative only.

The details of the method in practice at the time of my first acquaintance with the work were identical with those described by Famulener and Lyons with

the exception that in addition to recording the degree of incoördination, other symptoms, such as degree of preliminary excitement, of drowsiness, and of fall in temperature, were preserved as part of the record. At some time in 1900 record of these by-effects was discontinued as being non-essential and subject to greater individual variation than the degree of incoördination which is typical of cannabis intoxication. In reporting on the pharmacological identity of American and Indian cannabis Houghton and Hamilton[7] described the method as modified and regularly applied at that time.

While practically all the writers up to this time had selected the dog as the test animal, Goodall[8] writes, "At present my standard is that a dose of 1/4 grain should kill or deeply narcotise frogs of 20 Gm."

Haskell[9] refers to Houghton's as the only assay method known.

This method is again described in concise form in the Report of the A. Ph. A. Committee on Physiological Testing.[10]

Pittenger,[11] in 1914, published the same assay method but with no dosage specified and no material changes.

Pearson[12] emphasizes the need of and difficulty in selecting susceptible dogs, also noting that continued dosing does not produce any immunity.

Eckler and Miller[13] seem to be the first to describe the use of a particular breed of dog but not in the sense of specifying the exclusive use of this breed. Hamilton, Lescohier, and Perkins[14] touched on a phase of cannabis standardization not apparently considered by other investigators. In order to corroborate for human therapy the fact established by animal experimentation that cannabis preparations are equally valuable from whatever source the crude drug is derived, and require only the ordinary phsyiological assay, these investigators carried out several series of tests on themselves, using both Indian and American grown drug. Their conclusion is that no difference in the effects of the two varieties could be detected.

Finally, we come to the U. S. P. Revision Committee's Report now embodied in U. S. P. IX[15] and made official for the assay of *Cannabis Sativa*. This report includes several steps not previously suggested as essential in assaying this drug, namely, 1st, Fox terriers for the test animal but not exclusively; 2nd, Doses of 0.03 mil for F. E. Cannabis, 0.3 mil for the tincture, 0.004 Gm. for the extract, 3rd, Preliminary fast of 24 hours for the dogs used.

Previous to this the only requirement in the test animal was susceptibility. The doses suggested by Houghton and Hamilton, Famulener and Lyons and Eckler and Miller were 0.01 Gm. of extract, 0.1 mil of fluidextract and 1.0 mil of tincture per kilo of dog weight. The period of fasting was suggested at several intervals up to 12 hours. The intention of the official method is to require these preparations to produce an observable reaction with the specified doses while previous authors made use of doses of such size that a weaker preparation would have a measurable reaction, evident but less intense than that required for a standard preparation. This feature shortens the test of a weak preparation in that a clue to its activity is likely to be obtained in the first test, while by the official method only a standard (or better) preparation would show an effect.

It is evident, therefore, that the official method differs only in some of its details from that previously followed but that these complicate the method by including non-essential details and by increasing the difficulties of the test.

ERGOT.

In very early times this drug was used in obstetrics by the Chinese and the Romans. Salerne,[1] in 1754, and Tessier,[2] in 1778, found that gangrene occurs in young pigs after administration of ergot.

Dietz noted that one to three ounces of ergot would cause gangrene of the combs of birds.

Wiggers[3] fed 9 grains of an extract he called "ergotin," obtained by alcoholic extraction, to a cock and caused convulsions and death. This probably occcurred too quickly for the typical bluing of the comb to appear since he noted only that the comb became cold.

Bonjean[4] obtained an aqueous extract purified by precipitation with alcohol to which he also gave the name "ergotine." This caused the typical bluing of comb and wattles and a narcotic condition which demonstrated to him that it contained the therapeutic agent.

Kobert,[5] in carrying out investigations of ergot bodies in 1884, used all the laboratory animals including cocks, frogs, pigs, rabbits, cats, and dogs. He used also the isolated uterus of the sheep and considered this the most suitable method of testing ergot, but as a second and final test it must produce abortion in pregnant animals with no other untoward effect.

Jacobi's work in 1897[6] was probably the most important to that date because he carefully checked up his chemical investigations by means of physiological tests. He noted its action on the uterus, on the cock's comb and on blood pressure, the three characteristic effects of this drug.

All the work recorded to this time has been on experimental bodies with no reference to standardization of commercial products. Houghton,[7] in 1898, proposed, in a paper before this Association, applying the Cock's Comb Method for the routine assay of commercial ergot preparations, the method of administration then followed, being that of feeding the crude drug, and by means of a catheter introducing fluid preparations into the rooster's crop.

About this time the work of Barger, Carr and Dale,[8] who wrote voluminously at this period, seemed to have cleared up much of the uncertainty regarding the identity and character of the active constituents of ergot. They showed that different constituents were responsible for the different physiological effects noted. Thus they demonstrated that the aqueous extract as well as an alcoholic can contain an active agent. Ergotoxine, an alkaloid, appears to be the agent causing the bluing of the cock's comb, *p*-oxyphenylethylamine or tyramine is the pressor agent although the alkaloid acts in this way too, while *B*-iminazoylethylamine or histamine is the principle which acts on the non-pregnant uterus and in most cases lowers the blood pressure of anesthetized dogs and rabbits. This work shows conclusively why no assay method based on the amount of any one active constituent present is adapted to the standardization of this drug.

Dohme and Crawford,[9] after considerable experimentation, evolved the method of injecting hypodermatically solutions of the fluidextract and of Keller's Cornutine using 5 Cc. of the former and equivalent amounts of the latter. They concluded that cornutine represents practically all of the therapeutically active substances of ergot and that an assay for Keller's cornutine is the correct means of standardizing this drug for its vaso-constrictor virtues. Dohme[10] later con-

cluded that this was not a correct method because samples of ergot very low in cornutine were quite active when tested by physiological means.

Barger and Dale[11] suggested a method known as the vaso-motor reversal. The end-point of this reaction is the complete neutralization of the pressor effect of 0.1 mg. of adrenalin.

The later recognition of the various active agents of ergot easily explained why this method is very inaccurate.

Kehrer[12] found the isolated cat uterus suspended in Ringer's Fluid the most satisfactory method for assay and believed that the manufacturer has in that a means of assuring standardized products. From his work with this and with the cock's comb method he concluded that the same active agent is not concerned in the two effects since one disappeared more rapidly than the other.

Goodall[13] agreed with Kehrer in the use of cats, but employed as the end-point, the action on blood pressure—20 min. of liquid extract intravenously administered should raise the pressure 20 mm. of mercury in an animal of 1500 Gm. He, however, recognized the presence of both pressor and depressor substances and concludes that "In the present state of knowledge it is hardly possible to adjust the therapeutic dosage of ergot to physiological findings."

Cronyn and Henderson[14] pointed out that failure to obtain satisfactory blood pressure records is largely due to the anesthetic—a volatile anesthetic partially nullifying the pressor action. This has also been observed by others. They reached the same conclusion as that of Goodall that no thoroughly reliable method is known for establishing uniformity in ergot extracts. Their work with the cock's comb method is, however, open to criticism on account of using different breeds of roosters and not more carefully standardizing the technic.

Probably no more extensive experiments have been carried out to select a satisfactory assay method for ergot than were those of Edmunds and Hale,[15] who reviewed the literature critically, examined the various methods which had been suggested, and finally selected as least subject to inaccuracies the cock's comb method, the end-point recommended being that 1 mil of the fluidextract injected deeply into the breast muscles must blacken the comb in one hour. As a standard they suggest that 1 mil of fluidextract blacken the comb to the same extent as $2^1/_2$ mg. ergotoxin phosphate.

Pittenger and Vanderkleed,[16] in 1914, suggested as the most logical and accurate method for standardizing ergot, its action on the isolated uterus muscle. This method, in the light of the chemical and pharmacological investigations of Barger and Dale, is not applicable for their standardization. They considered ergotoxin to be the most valuable principle in ergot and also that it has little action on the uterus.

My personal experience with the standardization of ergot suggests the use of White Leghorn cocks not over 1 year old, sufficiently susceptible to the action of ergot so that 1 mil of the fluidextract shall blacken the comb in a typical manner and to a reasonable degree in one hour. The roosters for test purposes have an individual record of the average degree of blackening to be expected and are frequently retested with a standard fluidextract to verify their susceptibilities.

Knowing as we do that different constituents of ergot have different pharmaco-

logic effects it is difficult to select for test purposes a reaction which surely represents the desirable therapeutic action of the drug.

The chemist finds certain constituents to be present; the pharmacologist determines their typical effects but rarely has the physician had full opportunity to conclude as to which is the substance concerned in the therapeutic effects of the drug.

As an oxytocic agent one would naturally believe that only the constituent acting on the uterine muscle is of value, while as a hemostatic the pressor effect seems the logical measure.

But histamine, which has a selective action on the uterine muscle, has not proved to be a valuable oxytocic agent when used alone. Further, it lowers the blood pressure of most anesthetized animals and thus obscures the pressor effect and makes the blood pressure test of the drug an uncertain measure of its value as a hemostatic.

Tyramine, another of the constituents isolated from ergot, is said to act on the uterus and to raise the blood pressure both effects probably due to its action on unstriped muscular tissue.

Ergotoxin has much the same therapeutic effect, and pharmacologically has the typical action of bluing the cock's comb.

The logical conclusion, therefore, from this is that the cock's comb reaction is not obscured by counteracting substances as is the pressor test and with our present knowledge is the most satisfactory of the various tests proposed.

THE DIGITALIS SERIES OF HEART TONICS.

The earliest recorded attempts actually to standardize the members of this series are apparently those of Fagge and Stevenson[1] in 1866. They claimed that the physiological tests of these medicinal substances would be of great medico-legal importance.

They carried out tests on most of the members of the series but particularly on digitalin. The method used was that later called the Focke Method and consisted in exposing the heart of the weighed frog, which was then attached to a cork. The solution was injected subcutaneously into the thighs and the time noted when the heart stopped in systole. The time elapsing between injection and systolic stoppage was selected as the basis for the relative toxicities of the different samples. They considered frogs much more satisfactory than the higher animals because of ease in examining the different organs and the rapidity of their reaction to the drug.

Koppe[2] carried out similar experiments on the separated constituents of digitalis, using the same technic and end-point as the earlier writers. He used other animals also, dogs, cats and rabbits, to which the drug was administered mostly subcutaneously, noting in the dog and rabbit the changes in the rate and strength of the heart beat, in the cat and dog also the amount necessary to induce vomiting.

In 1881, Bennefield[3] undertook the examination of tinctures of digitalis from different parts of Germany. Chemical and physical methods failing, he applied physiological tests, using the rabbit. His technic was that later adopted by Hatcher for his cat method, namely, to inject the solution slowly into the jugular vein until the animal dies. The solution injected was prepared by evaporating

the tincture to constant weight and digesting the residue with water at a moderate temperature, using a filtered solution for injection.

Fraenkel,[4] in the same year, examined different preparations of digitalis on the dog. The animal was curarized and injected subcutaneously. He observed three typical effects of digitalis, the increased blood pressure, decreased rate and increased amplitude of the heart beat.

Gley,[5] in 1888, tested ouabain and strophanthin on the laid-bare frog's heart and observed that with equal doses systolic stoppage was accomplished in half the time with the former. He also determined their toxicity on guinea pigs, dogs, and rabbits.

Reusing[6] compared the action of strophanthus and digitalis using frogs. He not only studied the effect on the exposed heart, as in previous methods, but applied also a perfusion method.

Bardet[7] examined the various active constituents of digitalis employing frogs and rabbits in the method known as the M. L. D. method, the first recorded account of the use of frogs in this, the simplest application of the physiological test, the method adapted by Houghton for quantitative assay purposes.

Fouquet[8] also determined only the M. L. D., using frogs, dogs and rabbits, administering the material subcutaneously with as little alcohol as would dissolve the substance.

Prevost,[9] examining Swiss Pharmacopoeial digitalis extracts, used frogs and chose for the end-point the minimum systolic dose. He considered the frog by far the best adapted to the work.

Houghton,[10] in 1898, in October took the first step in advance of other pharmacologists of this time by adopting as a routine procedure the physiologic assay of the heart tonics on frogs, using the M. L. D. as the end-point. This method was further elaborated and presented before the Pharmaceutical Section of the 7th International Congress of Applied Chemistry on May 31, 1909, at which time he suggested a Heart Tonic Unit based on the M. L. D. and proposed this as an international standard for the assay of the digitalis series.

Jacquet,[11] recognizing the importance and the applicability of the physiological test in arriving at exact dosage of digitalis, described his method and recorded his results in 1897 but did not propose the routine application of the method until December, 1898. His method was the systolic stoppage of the frog's heart, but he used rabbits as well, adopting as an end-point the minimum lethal dose.

Fränkel,[12] taking up the subject again, used the systolic stoppage of the frogs heart as the end-point but made an important forward step in fixing the time at which stoppage in systole must take place at one hour, thus varying the dose instead of the time. This approaches still more closely the method of Focke and Gottlieb, and is almost identical with the present U. S. P. Method.

Famulener and Lyons[13] adopted the same general method probably about the same time in studying the relative values of different digitalis extracts and the active constituents of digitalis.

Ziegenbein,[14] using a method credited to Hans and Arthur Meyer but really originated by Fagge and Stevenson, examined a number of different species of digitalis and found them to differ greatly in toxicity. He selected a two-hour interval in which the drug should act to induce the systolic stoppage.

With all the imperfections which he had observed in the physiological methods he considered that only by the use of the frog could one obtain a degree of uniformity in the activity of digitalis preparations.

Moschkowitsch,[15] in 1903, on the basis of considerable experimentation, regretted to report that he failed to substantiate the results of Focke, Prevost, and others by use of frogs, but his failure seemed to carry no particular weight against physiological testing.

The reason for this is probably twofold, first, because some of his work is open to criticism and, second, because all who have experimented in pharmacologic assaying recognize the difficulties and discouragements involved, and, further, realize that chemical methods have even less evidence in their favor.

Focke[16] wrote voluminously on the physiological assay of digitalis and a method known by his name was given tangible form in 1902.

He applied the principal first used by Fagge and Stevenson, but modified for quantitative results. He obtains a value $V = p/dt$, in which p is weight of the frog, d the dose, and t the time of systolic standstill.

The objections to this, the second modification of the frog-heart method in its quantitative application, are first, that the short time selected for obtaining results, namely, 7 to 10 minutes, is too short for complete absorption of the drug and is thus inapplicable to extracts containing much inert material; second, the laying bare of the heart of an unanesthetized animal is contrary to the best pharmacologic procedure, and further, is certainly a factor in affecting the results adversely; third, the use of so few frogs does not allow for sufficient elimination of exceptional frogs—those much more or less resistant than the average. It has never found adherents in the U. S.

In addition to applying a quantitative method to digitalis assay, Focke experimented with leaves from different sources, of different ages, wild and cultivated, the effect of moisture on deterioration, and the seasonal and temperature effect on the frog. In all, while not much of his work was purely original, he added considerable to our knowledge of this drug and its standardization.

Santessen[17] used another modification of frog-heart method in that he observed the effect on the heart, but did not expose it until the heart had practically reached systolic standstill. He recognized the difficulties of physiological standardization and the importance of the factor of individual resistance as well as the general factors which affect results in such a method.

Hatcher[18] first adopted the systolic stoppage of the heart in one hour as the method and end-point for assay purposes, but later wrote on his experiments with the cat method, adapting the technic of Bennefield, that of slowly injecting the material into the vein over a period of 90 minutes, death to take place at that time. This is the first suggestion of the practical use of this method for quantitative assay and it may be said that while there seems little to recommend it, the method has appealed to some as of considerable importance. One of the arguments for it, or rather used against the M. L. D. frog-heart method, is that a product may possess toxic principles which are of no therapeutic value but which appear valuable by strictly M. L. D. methods. It should be noted, however, that the cat method is nothing more than an toxicity test with the disad-

vantage that the characteristic systolic stoppage cannot be observed to identify the cause of death.

Hatcher, himself, admitted that he found unaccountable variations of about 50 percent and his tables show even greater variation than he admitted.

Robinson and Wilson,[19] in some experiments to establish the character of the digitalis action on the cat's heart, observed a total variation of 100 percent in the lethal dose.

Reed and Vanderkleed,[20] objecting to the use of frogs because of the number of variable factors concerned, proposed the M. L. D. of guinea pigs as a quantitative method. They have, however, failed to prove that guinea pigs have a constant resistance and that death results from a direct action on the heart. It is another M. L. D. method with no technic to confirm the cause of death, such as is available in the frog-heart methods.

The work of Sollmann and others[21] in showing the influence of temperature on the toxicity of the digitalis series to frogs is well worth noting and is highly important. This variable factor, however, is offset in both the frog-heart methods by the use of the standard for comparison in every assay thus eliminating this as well as other uncontrollable factors, such as, climate and season and the species and weight of the frogs.

Heintz,[22] in 1912, recognizing the limitations of the various physiologic tests proposed, suggested applying not one but several tests, including the M. L. D. and M. S. D. on frogs, the M. L. D. on mice, and the pressor action on the circulatory system of rabbits and cats. The toxic dose on mice is by internal administration with food in pill form. His proposition has received little comment.

Krogh[23] used the isolated frog's heart and determined the lowest concentration of the drugs which would arrest the spontaneous rhythm. He considered the method accurate within 10 percent.

One other proposed method remains to be noted, namely, that of Pittenger,[24] who suggested the use of gold fish which are particularly susceptible to the influence to poisons in water. It is probably the simplest method heretofore proposed but it appears to have gained insufficient recognition for criticism. It is another M. L. D. method and allows of no means of identifying the poison that causes death.

Of the methods quoted only the M. L. D. and M. S. D. on frogs, and M. L. D. on guinea pigs and cats, are practiced in the U. S. The M. S. D. on frogs is the one suggested in U. S. P. IX as adapted to the standardization of this important series of drugs.

The cat method, as stated before, is purely a toxicity test and can be classed with that on guinea pigs as objectionable because death is almost invariable due to paralysis of the respiratory centers, and, therefore, not directly a measure of the heart tonic value.

As stated by Edmunds and Hale, there is little to choose between the M. L. D. and M. S. D. on frogs. To one who has been accustomed to the former, however, it has three advantages over the M. S. D. method, first, in the use of a larger number of frogs with less work and actual time involved; second, in the elimination of the factor of slow absorption, and third, in the fact that the end-point is not obscured by rough handling such as by the pithing and laying bare of the frog's heart. At the same time it has the only advantage claimed for the M. S. D.

method in that the frog's heart can always be examined to verify the identity of the toxic principle.

THE PITUITARY GLAND.

While the extracts of this gland have widely different effects, such, for example, as the pressor, diuretic, glactagogue, cathartic, and oxytocic actions, no undisputed chemical evidence has been brought forward to demonstrate the presence of more than one active constituent—a substance which acts on plain muscular tissue and is responsible for all the phenomena noted.

As assay methods, only three have been proposed and of these only two are generally used, one being official in the 9th Rev. of the U. S. P.

The first method proposed is that by Dale and Laidlaw,[1] who in 1912 described the method which with some modifications is now official. It consists, in brief, in using the isolated uterine muscle from a young guinea pig of not to exceed 350 Gm. weight. One horn is removed, suspended between a fixed and a movable attachment in artificial blood plasma (Locke's solution), heated to body temperature, and the solution to be tested is thoroughly mixed with the Locke solution to make a homogeneous mixture in contact with the uterine muscle. It is claimed that when all the conditions are rigidly followed the contractions of the uterus will vary according to the amount of active principle present in the solution.

There are many factors affecting the sensitiveness of the muscular tissue used in the test and, therefore, affecting the quantitative accuracy of the method such, for example, as the size, age and condition of the pig, the temperature changes of the solution in contact with the specimen, and the presence of foreign substances in the Locke's Solution or in the pituitary extract.

The method has been later described by a number of authors in each case with some slight variation in technic.

Führer[2] applied this method in attempting to prove the separation from the gland of four active constituents with different properties. One of these constituents was considered to be the active principle, but others had similar properties less strongly pronounced.

Heidelberg, Pittenger and Vanderkleed[3] consider the oxytocic to be the only method practicable for quantitative assaying, describing in minute detail the apparatus and technic used by them.

Guggenheim[4] used the rat uterus with approximately the same technic. There was no exceptional contraction observed, but after applying hypophysis extract to the uterus it maintained a steady contraction instead of the normal rhythmic contractions.

Roth[5] described the Dale method in minute detail with his modifications and concluded, on the basis of considerable experimentation, that it is the most satisfactory assay method, he having also applied tests by the intact uterus and the bood pressure. The intact uterus is so rarely used that it is not regarded as a distinct method.

For a standard in carrying out the uterine contraction assay Roth proposed and used a solution of histamine which acts similarly to pituitary on the uterine muscle but which more often lowers than raises blood pressure. The final dilution of histamine found best suited in most cases is 1 in 20,000,000, which, in comparison with two of the best known commercial preparations, diluted 1–15000

caused equal contractions. No tracings were submitted to substantiate these statements.

For the pressor test, histamine not being applicable, a commercial preparation was selected for comparison with the others. The blood pressure method was proposed by Hamilton[6] the same year that Dale's method was published.

Disregarding, because of expediency rather than for any other reason, the physiological effects of pituitary extracts other than that on the circulatory system, this author proposed a pressor test by which the activity of the extract could be measured with considerable accuracy.

The dog anesthetized with chloretone was used in the same general way as for standardizing suprarenal gland extracts, comparison being made between the sample and a standard prepared from the dried, defatted, powdered posterior lobe. The standard material was prepared in considerable quantity in order to represent an average product. The amount to be injected at one time was specified as 1 mil of the solution to be obtained by dissolving the soluble part in acidulated water, using 1 Gm. to 1000 Cc.

The method was described in greater detail by Hamilton and Rowe,[7] who critically analyzed the two methods pointing out the discrepancies in Roth's results and particularly calling attention to the failure of the oxytocic method as a measure of pressor action of pituitary extracts because of the use of histamine as a standard, since the latter is usually not a pressor agent. It also is questionable as a standard since its clinical action is not identical to that of a pituitary extract. The unqualified use of histamine as the standard was also criticised by Pittenger and Vanderkleed[8] and by Pittenger[9] who have not found different lots of histamine equally active while solutions have not been proved to be stable.

The U. S. P. 9th Revision Committee gave no details of the test but directed attention to the method as described by the Hygienic Laboratory. The strength of the official solution, however, has been specified as equal to that of histamine 1 to 1000, a value estimated by different authors as being from 10 percent to 40 percent as strong as a good commercial preparation. This has been noted by Pittenger,[9] Hamilton,[10] and Eckler,[11] and the result of the statement is that no official preparation has appeared on the market, since strict adherence to this standard would in some cases lower the activity of the preparations considerably below the present high standard.

The objections to the oxytocic method other than those concerning the character of the standard and the activity of the official product are principally to the fact that the uterine muscle is so sensitive to other stimuli than that specific for pituitary extracts, that uniform quantitatively accurate results are not obtainable, the reaction being rarely proportional to the amount of extract applied.

The principal objection advanced against the pressor test is that the dog, while least subject of all animals to this fault, does not remain sensitive to repeated injections but becomes progressively less responsive after the first two or three. This, however, has not proved a valid objection in the work of the author.[7,9]

The third method proposed is that of Spaeth,[12] who uses the melanophores of *F. heteroclitus*. "As a result of this work it appears that the melanophores of Fundulus and probably of all other teleost fishes must be considered functionally

modified smooth muscle cells." These melanophores or pigment cells of the fish are a part of the scales.

In the assay method these scales are placed in the pituitary solution and the resulting contraction is evidenced by the apparent bleaching out of the pigmented portion of the scales. This effect is also produced by potassium chloride in 0.1 *N* solution and it is proposed that a dilution of this solution shall be used as a standard for comparison.

The standard test solution is a mixture of 0.1 *N* KCl and it is proposed that a dilution of this solution shall be used as a standard for comparison. The standard test solution is a mixture of 1 part 0.1 *N* KCl and 2.5 parts 0.1 *N* NaCl. The solution of pituitary extract is to be mixed with an equal amount of 0.2 *N* NaCl—a dilution which he suggests as "a uniform standard for pituitary extract." As the author has had no experience with the method—this test animal not being available in inland towns—it will not be discussed except from its superficial aspects.

It is not an illogical test in that the same general effect of pituitary extracts as those acting in the other methods is made use of, namely, the constricting action on smooth muscle—an effect which should be fairly transferrable from any one kind of tissue to another. The use of KCl as a standard instead of a standard pituitary product is no more illogical than the use of histamine in the oxytocic test.

It is improbable that the use of a test object not easily obtainable in every locality would ever appeal to the average investigator unless the method were pre-eminently satisfactory. This has not been demonstrated either by the originator of the method or by any other investigator.†

The principal points to be considered in comparing the practicability of the first two methods (omitting the third since no data on it are available), are as follows: The pressor test measures the constricting effect of pituitary extract on smooth muscle and has been found free from many of the objectionable features of the oxytocic effect, such as its supersensitiveness and lack of uniformity in results. The dog contrary to Roth's statement (which he failed to prove), does not become progressively less reactive to pituitrin if the proper technic is followed.

The pressor test, therefore, seems equally applicable for assay of pituitary extracts and much more practical for routine analysis.

THE SUPRARENAL GLAND: ADRENALIN.

The physiological standardization of extracts of this gland depends entirely on its constrictor effect, and the assay method now used to the exclusion of all others is the constricting action on the arterioles causing an increased blood pressure. In fact, so completely has this effect taken the place of other reactions that the use of any other test is not considered.

Oliver and Schafer,[1] in 1894 and 1895, noted the marked blood-pressure-raising action of these extracts as did also a number of others about the same time.

Von Fürth, in 1898,[2] carrying out pharmacologic tests in conjunction with his chemical experiments, observed that when a substance isolated from the gland

† Unofficial reports from the Hygienic Laboratory are to the effect that this method was found to be inaccurate and impracticable.

was intravenously administered in a dose of 0.000025 Gm. to a rabbit the blood pressure rose 114 to 116 mm.

Among others who wrote of this reaction is Gottlieb, whose contribution[3] is noteworthy because of the tracings showing the action of suprarenal extract on the circulatory system of a dog, the blood pressure of which had been reduced to zero by paralyzing the heart with potassium nitrate.

This combined action on the heart and circulatory system is the effect which forms the basis of the method proposed by Houghton[4] in a paper read before this Association in 1901.

The method in brief consists in the use of an anesthetized dog, the injections being made intravenously and the results recorded from the carotid artery by means of a kymograph. The injections can most conveniently be made into one of the femoral veins and the record made and preserved on a sheet of blackened paper on the revolving drum of the kymograph. Tracings obtained in this way are shown in which the rise in blood pressure varies directly with the amount of active agent injected.

My personal experience with this method began in 1900 at which time the standard used for comparison was a carefully prepared and preserved extract of the gland so diluted before injection that the rise in blood pressure would not in general be greater than 20 to 30 mm.

In 1902, in a second paper by Houghton,[4] the method was amplified and the active constituent, adrenalin, was proposed as the standard with the test dose for the average dog 1 mil of solution of adrenalin chloride containing 0.00001 Gm. per mil. This is by no means a minimum active dose but was selected as the dose from which the reaction was most sensitive to minute changes. Thus it is easy to distinguish a difference of 5 percent more or less than this amount when injected into an average dog and, therefore, permits of standardization within those limits of error.

No material change from this technic was proposed by anyone until the Revision Committee of the 9th U. S. P. included the suprarenal gland among the drugs for which a physiological test was proposed. To the casual reader the two methods are identical but to the operator there are several points of difference which have received critical comment by Hamilton,[5] who pointed out sources of error in the described technic.

Cameron,[6] in 1906, after trying various other methods, chose the blood pressure method as the most convenient and reliable for the purpose of standardizing suprarenal products.

Hunt[7] and Sollman and Brown,[8] using the same general method, assayed and reported on several commercial samples.

Crawford[9] reviewed the literature and gives minute details used in applying this method, but suggested no additional methods.

Läwen,[10] using the same kind of a reaction, but applied by perfusion through the blood vessels of the frog, demonstrated the constricting effect but found the animals to vary considerably in their response.

He observed the effect of a mixture of cocaine and suprarenin, as Braun had first noted to be a localization of the former and thus to prevent its general action.

Ehrman[11] applied the reaction to the pupil of the enucleated frog's eye, the

constricting effect in this case being on the iris, thus causing a measurable dilatation of the pupil. He considered the method equally accurate with other applied methods but his results show that a dilution of adrenalin corresponding to the commonly used test solution, namely, Solution Adrenalin Chloride 1–1000 diluted 1 in 100, *i. e.*, 0.00001 Gm. per Cc. was inactive.

In this historical account of physiological standardization no attempt has been made to have the references exhaustive because many of the workers along these lines have made no attempt to apply the test quantitatively. On the other hand, a number of the authors quoted have not contributed directly to the development of drug standardization but their work has been very helpful in pointing the way and for that reason is too important to be omitted.

In collecting the bibliography I have been greatly assisted by consulting the records of a number of authors who have in some cases had access to more extensive libraries than were available to me.

It is evident from a study of the collected references abstracted that there has been no orderly development of the methods official or unofficial now in use to assay these important drugs. In two cases—Cannabis Sativa and Adrenalin solutions—there has been only one method for each adopted for general use and in both cases that method made use of one of the first typical effects observed. In the other three cases Ergot, the digitalis series and pituitary gland extracts—two or more methods are in common use and there seems no way to reconcile conflicting opinions.

The reason for this is that in no case is any opinion wholly right or wholly wrong and no one is inclined to give up a method which in his hands has given fairly satisfactory results for one which does not appeal to him as being either more logical or more accurate.

If it were possible to check up by clinical tests the results obtained by the different methods of pharmacologic assay—if for example, it were possible to determine which is the better of two samples of pituitary extract, alike by one method of assay and different by another—then differences of opinion as to the adaptability of any particular method would vanish. This, while apparently a simple means of eliminating discord has never been worked out in practice and we seem no nearer to a satisfactory solution of the problem than at any time in the past.

How serious these differences of opinion are as to which method of assay is correct the following quotation from a letter which passed between two state universities will serve to illustrate: "Permit me to call your attention to the fact that the studies of Roth and Edmunds and many other workers merely relates to the toxicity (of digitalis). Furthermore, in this connection the U. S. P. suggests a standard based on toxicity which, in the opinion of Hatcher and many other workers, is not the measure of the therapeutic value of the drug. A sample may be toxic and high in vaso-constrictor properties, and at the same time be absolutely contra-indicated in 90 percent of the cases where digitalis is called for."

The above quotation is evidence that the official recognition of a method is not sufficient to obtain its general recognition and shows how valuable some clinical evidence would become if it were practicable to obtain it.

The history of Physiological Standardization to date is a record of wonderful development in the face of many discouragements. The opposition has, however, largely broken down and thus the way is cleared for still greater achievement. With the active coöperation of the clinician much might be accomplished which under present conditions is next to impossible.

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O. HENRY, PHARMACIST.

C. Alphonso Smith, the author of the O. Henry Biography, has recently discovered the origin of O. Henry, the nom de plume of the late William Sydney Porter. He writes that he had long suspected the source of the name, but that his surmise was not confirmed until he received the following letter from Dr. Paul Barringer, president of the Virginia Polytechnic Institute. Doctor Barringer writes:

"At various times in my life I have run upon chemical analyses made by a Continental chemist who signed himself 'O. Henry.' While the substances under analysis were adapted to use in the Materia Medica, I had no idea until recently that the man was a pharmacist. In looking up the preparation of hydrocyanic acid in the United States Dispensatory, I found O. Henry twice referred to, in short search. Seemingly he was of Antwerp, as he wrote a good deal for the *Journal de Pharm. d'Anvers*, and also Paris pharmaceutical papers. In fact, I find his trail from 1833 to 1857, and he touched many of the lines a southern drug clerk would be interested in—quinine, cinchonine, etc. Can be it possible that this short, crisp, unusual name, that hits the eye from the page, ever caught the eye of the young drug clerk, Sydney Porter, and stuck?"

Mr. Smith says that on turning to the United States Dispensatory, which O. Henry used when he was a drug clerk in his uncle's store in Greensboro, N. C., he found frequent references to O. Henry. He comments: "When it is remembered that Will Porter had from early boyhood an unerring feeling for odd and narrative names, as well as faces, and that he was filling prescriptions when he first signed the name O. Henry to a short story, the evidence becomes, it seems to me, practically coercive that here and here alone the pen name took its origin."

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publication than those of the Association, except by consent of the Committee on Publication."—By-Laws, Chapter X, Art. III.

Reports of the meetings of the Local Branches should be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten, with wide spaces between the lines. Care should be taken to give proper names correctly, and manuscript should be signed by the reporter.

NEW YORK.

The December 1918 meeting of the New York Branch of the American Pharmaceutical Association was called to order by President J. L. Turner in the Lecture Hall of the New York College of Pharmacy Building on Monday, the 9th, at 8.30 o'clock.

Thirty-five members were present.

The minutes of the previous meeting were read and approved.

REPORT OF THE OFFICERS.

Treasurer Horstmann sent word that he could not be present, but would mail the report.

Member of the Council.—Jeannot Hostmann had no report.

Membership Committee.—An application was received from Max Soskin, 439 Brook Ave., New York City.

Fraternal Relations.—Chairman Leon Lascoff had no report to bring in.

Audit Committee.—Chairman Jacob Diner reported that a number of bills had been passed and paid.

Legislation and Education.—Chairman Robert Lehman brought in a lengthy report, which was ordered accepted with the thanks of the Branch.

Under regular procedure the following nominating committee was appointed: Drs. Mayer, Anderson and Arny.

SCIENTIFIC SECTION.

Dr. Geo. C. Diekman, of the Committee on Progress of Pharmacy, brought in a lengthy report and abstracts on the following:

Colormetric test of brucine.

Assay of opium.

Examination of Oil of Pennyroyal.

Identity test for guaiacol.

Method for rapid destruction of organic matter.

Power of vegetable decolorizing.

Exp. and action of magnesium salts on growth of wheat.

Valuation of balsam of tolu.

Considerable discussion followed the reading of this report, which was ordered accepted with the thanks of the Branch.

Dr. W. C. Anderson discussed the work of the Kings County Pharmaceutical Association.

Dr. Jacob Diner, Mr. Jacob Weil and Dr. Leon Lascoff reported that they wished to go on record that the Manhattan County Pharmaceutical Association would willingly join the American Pharmaceutical Association.

Dr. Joseph L. Mayer read a memorial in honor of Dr. F. E. Niece. It was moved, seconded and carried that a page in the minutes be set aside for these resolutions and that a copy be sent to the family of the deceased.

Under regular procedure the meeting was declared adjourned.

HUGO H. SCHAEFER,
Secretary.

COMMITTEE REPORTS

SOLDIER AND SAILOR PHARMACISTS.

WORK OF THE A. PH. A. ADVISORY COMMITTEE.*

The A. Ph. A. Advisory Committee for Soldier and Sailor Pharmacists is meeting with a hearty response from the Retail Drug Trade of the country. The reports of the Committee

* The Committee held a meeting in Cincinnati December 27, and for this reason this letter is not printed in full, it being expected that the report of the meeting will more explicitly include the statements omitted.

show that on December 14th there had been listed with it positions for 231 disabled pharmacists, in addition to 404 openings for clerkships to men who are not disabled. Many of the positions offered indicate exceptional opportunities for the returning men. Up to December 14th there were listed 565 drug stores, which are for sale to the returning men, in many cases under very advantageous conditions. Partnership openings are offered by 157 druggists, who have grown old in the business and would be glad to be relieved of a part of their work and responsibilities. In the case of many of these partnership openings, a returning Soldier or Sailor Pharmacist will need only to have ability and good reputation. The offer for positions and openings come from every State in the country, and with very few exceptions, from the smaller cities and towns. In the larger cities of the country, the Committee hopes to arrange for coöperation through Local Associations, and is even now assured that the opportunities in the larger cities will be very great. The work of the Committee has only just commenced, and the early returns prove that it will be able to accomplish a great deal. The data gathered up to this time make plain that good drug clerks are in great demand in every section of the country, and the men who will first return from the Service will have no difficulty in finding positions, but it is also found that many places made vacant by those entering the Service have been satisfactorily filled, and many women have found employment in drug stores who are likely to retain their positions. The real problem of the Committee in rendering effective service will come when the last half of the men return. It is anticipated also, that many drug clerks returning from the Service, who have no strong home ties, will be disposed to look for places in the larger cities, and an effort will be made to induce distribution throughout the country.

The Committee is receiving a great number of requests for assistance in securing the early return of drug clerks for positions which are held open. This is not thought to be a part of the Committee's work; such endeavor would be involved with great difficulty, and would hardly find the approval of the authorities. The present plan of the Army seems to be to discharge men as much as possible in groups, and not to attempt to single out individuals. In the Navy, by far the larger part of the pharmacists seem to have been placed in the Hospital Corps, and the Bureau of Medicine, of the Navy Department, advises that there is at present greater need for these men than there has been at any time during the War, and it will not be practicable to release them for several months.

The Committee confidently looks for the continued hearty coöperation of the druggists at home, and either by direct correspondence or through work of Local Committees means to secure and list every opening in the country. One of its difficult problems will be to reach all of the Pharmacists who are now in the Service and who are more or less distributed over all parts of the globe. It is realized that the greatest success of the Committee's work will depend upon reaching the men while they are still in the Service, so that they can be informed and make their plans very largely before they return to civil life. Unfortunately, neither the Army nor the Navy seem to have made arrangements for conveying information of interest to separate classes, and lack of facilities in this respect is apt to greatly hinder the agencies at home which would be helpful in the readjustment to civil life. The Committee is determined to find a way for reaching directly every Pharmacist who continues in the Service beyond an early time, but it realizes that with proper coöperation from the Authorities this part of its work would be greatly aided. Quite a number of small contributions have reached the Committee, all of which are listed by Treasurer H. M. Whelpley, and duly appreciated. It may be stated, however, at this time, that the successful work of the Committee will very greatly, if not entirely, depend upon having ample funds. The work cannot be done properly without having sufficient clerical and office help. It must be in mind that correspondence with possibly twenty thousand persons will have to be systematically handled, and many publications will need to be made. The Drug Trade of the country, which has so readily responded to the Red Cross, Y. M. C. A., K. of C., and War Chest Appeals, now has an opportunity to show its willing generosity to those in whom it is more directly concerned. Without ample funds the work of the Committee cannot be successful. Remittances should be made payable to H. M. Whelpley, Treasurer, and can be mailed to him at No. 2342 Albion Place, St. Louis, Missouri, or to the Chairman, Frank H. Freericks, at No. 1005 Mercantile Library Bldg., Cincinnati, Ohio.

COUNCIL BUSINESS

A. PH. A. COUNCIL LETTER NO. 7.

PHILADELPHIA, December 3, 1918.

TO THE MEMBERS OF THE COUNCIL:

The following letter addressed to the Secretary of the Council has been received from Frank H. Freericks, Chairman of the Advisory Committee for Soldier and Sailor Pharmacists:

"Am returning to you herewith the letter from Prof. Wulling, which has been read with great interest. Of course, it is now too late to speak of the enormous task which our Committee has undertaken, as a possible reason for not undertaking it, because our work is under way. We are having the hearty coöperation of all the pharmaceutical journals, and through the wholesale houses of the country are about to distribute fifty thousand circular letters and return questionnaire cards. We have been fairly swamped with demands for circular letters, such demands even now being for more than one hundred and fifty thousand. We are hopeful, however, that with the distribution of the fifty thousand, and with the publication of the questionnaire in all of the drug journals, that we will be able to reach every retail druggist in the country.

The enthusiastic responses and coöperation which we are already having from all sides convince me that our work will be of very great help, and that ultimately it can be of very great credit to the A. Ph. A. What our Committee now needs, is, the most hearty goodwill and coöperation on the part of everyone who has the welfare of the A. Ph. A. at heart. We thoroughly appreciate that we have undertaken no small task, but we want to demonstrate that the A. Ph. A. through its Committees is able to successfully carry through a very big task. I fear that Dr. Wulling has not become fully informed regarding the scope of our work. The finding of positions for the returning men is only one feature. Of course, we know that there is great demand for drug clerks in every community, but the tendency of those returning will be to stay in the larger cities, so that there may be three applicants for every position in the larger cities, while there is a continued scarcity in the smaller towns, unless this situation can be handled in some systematic manner for the entire country. There are possibly over a thousand men now in the Army who had their own stores, and who have sold them. Are these men to come back and start new stores, or is it not better to try to induce them to buy now existing stores from men who are willing to retire? Of the approximately ten thousand pharmacists and assistants, who are now in the Service, fully one-half will not have had advantage of Pharmacy college training. Will it not be for the good of Pharmacy if some of these men can be induced to take up college studies, and would it not be a wonderful thing for American Pharmacy, if two or three thousand of these men could be induced to spend even a year only at College of Pharmacy? The possibilities for American Pharmacy in this work are almost beyond appreciation at this time. My greatest fear rests in that we may fail to have complete coöperation and understanding on the part of some whose assistance will be almost essential. With a really heartfelt and unselfish assistance on all sides, we are bound to do a wonderful lot of good."

The letter of Frederick J. Wulling, referred to by Chairman Freericks, was as follows:

"I wonder whether the Soldier and Sailor Pharmacists' Advisory Committee realizes what a stupendous program of work it proposes to attempt?

So far as northwestern pharmacists now in service are concerned, I feel quite certain that when they return home every one will either be taken back to his former employment or will have no difficulty in finding suitable openings. In fact, I am confident that there will be competition for the services of these men.

I am heartily in sympathy with the establishment of a fund to be used in helping partly or totally disabled pharmacists.

As far as the other proposed undertakings of the committee are concerned they seem to me, at least as far as the Northwest is concerned, to be unnecessary."

The following budget of appropriations for 1919 is submitted by the Committee on Finance:

PROPOSED BUDGET OF APPROPRIATIONS FOR 1919.

Appropriations for general expenses:

No. 1	Salaries	$6,400
No. 2	Printing, Postage and Stationery	1,000
No. 3	Clerical Expenses, Secretary's Service	416

No. 4 Miscellaneous Expenses	200	
No. 5 Stenographers	350	
No. 6 Traveling Expenses	200	
No. 7 Committee on Membership	250	
No. 8 Committee on Unofficial Standards	100	
No. 9 Year Book	3,000	
No. 10 Premium on Treasurer's Bond	50	
No. 11 National Drug Trade Conference	200	
No. 12 Section on Scientific Papers	25	
No. 13 Section on Education and Legislation	25	
No. 14 Section on Commercial Interests	25	
No. 15 Section on Practical Pharmacy and Dispensing	25	
No. 16 Section on Historical Pharmacy	25	
No. 17 Women's Section	50	
No. 18 National Syllabus Committee	25	
No. 19 Committee on Recipe Book	50	
		$12,416
Appropriation for Open Accounts:		
No. 20 Journal	$6,250	
(*a*) Publication	$5,000	
(*b*) Clerical	800	
(*c*) Postage and Stationery	300	
(*d*) Freight, Drayage Miscellaneous	150	
No. 21 National Formulary	1,000	
No. 22 Badges and Bars	50	
No. 23 Certificates	50	7,350
		$19,766

Do you approve of Budget of Appropriations for 1919 as above proposed? This will be regarded as *Motion No. 10 (Approval of Budget of Appropriations for 1919)*.

J. W. ENGLAND,
Secretary.

415 N. 33rd Street.

A. PH. A. COUNCIL LETTER NO. 8.

PHILADELPHIA, December 23, 1918.

TO MEMBERS OF THE COUNCIL:

Motion No. 9 (Election of Members; applications Nos. 44 to 55 inclusive) and Motion No. 10 (Approval of Budget of Appropriations) for 1919 have passed.

The following communication has been received from E. N. Gathercoal:

"Hugo Schaefer of New York, has resigned from the Secretaryship of the Scientific Section. At the Chicago meeting Mr. Schaefer was also elected Local Secretary for the coming New York Meeting. Because of the multitude of duties connected with the local secretary's office, he requests that he be released from the Scientific Section work.

I, therefore, make the motion, seconded by W. B. Day, that the resignation of Hugo Schaefer as Secretary of the Scientific Section be accepted.

When the nomination of a successor to Mr. Schaefer becomes in order, I should like to move the nomination of A. G. DuMez of Washington, as Secretary of the Scientific Section for 1918–1919. Seconded by W. B. Day."

Motion No. 11 (Resignation of Hugo Schaefer as Secretary of Scientific Section). Moved by E. N. Gathercoal, seconded by W. B. Day, that the resignation of Hugo Schaefer as Secretary of Scientific Section be accepted.

A communication has been received from C. H. LaWall, seconded by E. G. Eberle, moving that the Budget of Appropriations for 1919 be amended to include an appropriation of $25 for expenses of Committee on Local Branches. This proposal has the approval of the Committee of Finance, but it has been received too late for amending the budget before January, 1919. Therefore, it is moved that an appropriation of $25 for expenses of the Committee on Local Branches be included in the budget as passed. This will be known as *Motion No. 12 (Appropriation of $25 for Expenses of Committee on Local Branches)*.

J. W. ENGLAND,
Secretary.

415 N. 33rd Street.

AMERICAN PHARMACEUTICAL ASSOCIATION

Organized: Philadelphia, 1852. Incorporated: Washington, D. C., 1888.

OFFICIAL ROSTER FOR 1918-1919.

GENERAL OFFICERS.

President—CHARLES H. LAWALL.....39 So. 10th St., Philadelphia, Pa.
Honorary President—OLIVER F. FULLER.....310 W. Washington St., Chicago, Ill.
First Vice-President—F. W. NITARDY.....66 Orange St., Brooklyn, N. Y.
Second Vice-President—THEODORE J. BRADLEY.....70 St. Botolph St., Boston, Mass.
Third Vice-President—FRANCIS HEMM.....2108 Locust St., St. Louis, Mo.
General Secretary—WILLIAM B. DAY.....701 So. Wood St., Chicago, Ill.
Treasurer—HENRY M. WHELPLEY.....2342 Albion Place, St. Louis, Mo.
Reporter on the Progress of Pharmacy—H. V. ARNY.....115 W. 68th St., New York, N. Y.
Editor of the JOURNAL—E. G. EBERLE.....253 Bourse Building, Philadelphia, Pa.
Local Secretary—HUGO H. SCHAEFER.....115 W. 68th St., New York, N. Y.

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First Vice-President—THEODORE J. BRADLEY.....70 St. Botolph St., Boston, Mass.
Second Vice-President—HARRY WHITEHOUSE.....Johnson City, Tenn.
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Members of the Council—J. H. BEAL.....801 W. Nevada St., Urbana, Ill.
Members of the Council—CHARLES H. LAWALL.....39 So. 10th St., Philadelphia, Pa.
Members of the Council—S. L. HILTON.....1033 22nd St., N. W., Washington, D. C.

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First Vice-Chairman—S. L. HILTON.....1033 22nd St., N. W., Washington, D. C.
Second Vice-Chairman—E. F. KELLY.....Lombard and Green Sts., Baltimore, Md.
Recording Secretary—JEANNOT HOSTMANN.....115 W. 68th St., New York, N. Y.

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Chairman—LEWIS C. HOPP.....1104 Euclid Ave., Cleveland, Ohio.
Secretary—JOSEPH W. ENGLAND.....415 No. Thirty-third St., Philadelphia, Pa.

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First Vice-Chairman—C. B. JORDAN.....409 Russell St., Lafayette, Ind.
Second Vice-Chairman—C. O. EWING.....Bureau Chemistry, Pharmacognosy Laboratory, Washington, D. C.
Secretary—HUGO H. SCHAEFER*.....115 W. 68th St., New York, N. Y.

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Secretary—C. A. DYE.....Ohio State University, Columbus, Ohio.
Associates—WILLIAM MANSFIELD.....Albany College of Pharmacy, Albany, N. Y.
Associates—E. L. NEWCOMB.....719 6th Ave., S. E., Minneapolis, Minn.
Associates—W. H. ZIEGLER.....213 Rutledge Ave., Charleston, S. C.

SECTION ON PRACTICAL PHARMACY AND DISPENSING

Chairman—R. W. TERRY.....Groveport, Ohio.
Secretary—Edward Davy.....21 E. 12th Ave., Columbus, Ohio.
Associates—WILLIAM GRAY.....1753 W. Congress, Chicago, Ill.
Associates—IRWIN A. BECKER.....Michael Reese Hospital, Chicago, Ill.

SECTION ON COMMERCIAL INTERESTS.

Chairman—E. FULLERTON COOK.....145 N. 10th St., Philadelphia, Pa.
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Associates—J. H. REHFUSS.....252 Summer Ave., Brooklyn, N. Y.
Associates—I. M. LIGHT.....31 W. Lake St., Chicago, Ill.

SECTION ON HISTORICAL PHARMACY.

Chairman—HUGO KANTROWITZ.....104 John St., New York, N. Y.
Secretary—W. O. RICHTMANN.....1721 Van Hise Ave., Madison, Wis.
Historian—E. G. EBERLE.....253 Bourse Building, Philadelphia, Pa.

WOMEN'S SECTION.

President—MISS ANNA G. BAGLEY.....48 E. Patterson Ave., Columbus, Ohio.
First Vice-President—MRS. W. L. DEWOODY.....Pine Bluff, Ark.
Second Vice-President—MRS. F. J. WULLING.....U. of Minn., Minneapolis, Minn.
Third Vice-President—MRS. F. W. MEISSNER.....820 Main St., LaPorte, Ind.
Secretary-Treasurer—MRS. JEAN MCKEE KENASTON.....Bonesteel, S. Dak.
Historian—MISS BERTHA OTT.....Bethesda Hospital, Cincinnati, Ohio.

*Resigned on account of his duties as Local Secretary, A. Ph. A.

GENERAL COMMITTEES.

(Appointed by the President.)

INTERNATIONAL PHARMACEUTICAL NOMENCLATURE.

OTTO RAUBENHEIMER, *Chairman*...Brooklyn, N. Y.
F. M. APPLE.....Philadelphia, Pa.
H. M. WHELPLEY.....St. Louis, Mo.
G. M. BERINGER.....Camden, N. J.
J. W. STURMER.....Philadelphia, Pa.

HEALTH INSURANCE.

HARRY B. MASON, *Chairman*.....Detroit, Mich.
HUGH CRAIG.....Detroit, Mich.
C. A. MAYO.....New York, N. Y.
J. H. BEAL.....Urbana, Ill.
W. C. ANDERSON.....Brooklyn, N. Y.

NATIONAL LEGISLATION.

JOHN C. WALLACE, *Chairman*.....New Castle, Pa.
J. H. BEAL.....Urbana, Ill.
A. R. L. DOHME.....Baltimore, Md.
S. L. HILTON.....Washington, D. C.

PATENTS AND TRADEMARKS.

F. E. STEWART, *Chairman*.....Philadelphia, Pa.
W. A. PUCKNER.....Chicago, Ill.
S. C. HENRY.....Chicago, Ill.
R. P. FISCHELIS.....Philadelphia, Pa.
C. L. ALSBERG.....Washington, D. C.

PHARMACEUTICAL SYLLABUS.

W. H. RUDDER, 3 Lyons Block, Salem, Ind.....Term expires 1919
E. L. NEWCOMB, 719 6th Ave., S. E., Minneapolis, Minn.....Term expires 1918
E. G. EBERLE, 253 Bourse Building, Philadelphia, Pa.....Term expires 1920
HARRY B. MASON, P. O. Box 484, Detroit, Mich.....Term expires 1921
GEORGE M. BERINGER, 501 Federal St., Camden, N. J.....Term expires 1922
H. H. RUSBY, 776 DeGraw Ave., New York, N. Y.....Term expires 1923
WILLIS G. GREGORY, 344 Richmond Ave., Buffalo, N. Y.....Term expires 1924

PHYSIOLOGICAL TESTING.

PAUL S. PITTENGER, *Chairman*....Philadelphia, Pa.
W. A. PEARSON.....Philadelphia, Pa.
H. C. HAMILTON.....Detroit, Mich.
HENRY C. COLSON.....Baltimore, Md.

REVISION OF CONSTITUTION AND BY-LAWS.

J. H. BEAL, *Chairman*.....Urbana, Ill.
J. W. ENGLAND.....Philadelphia, Pa.
H. M. WHELPLEY.....St. Louis, Mo.
G. M. BERINGER.....Camden, N. J.
HARRY B. MASON.....Detroit, Mich.

STATUS OF PHARMACISTS IN GOVERNMENT SERVICE.

S. L. HILTON, *Chairman*.....Washington, D. C.
G. M. BERINGER.....Camden, N. J.
C. A. MAYO.....New York, N. Y.
W. B. DAY.....Chicago, Ill.
E. G. EBERLE.....Philadelphia, Pa.

UNITED STATES PHARMACOPOEIA.

E. N. GATHERCOAL, Chicago, Ill.....Term expires 1919
E. FULLERTON COOK, Philadelphia, Pa.....Term expires 1920
E. H. LAPIERRE, Cambridge, Mass.....Term expires 1921
H. A. B. DUNNING, Baltimore, Md.....Term expires 1922
HERMANN ENGELHARDT, Baltimore, Md.....Term expires 1923
A. B. LYONS, Detroit, Mich.....Term expires 1924
WILLIAM MITTELBACH, Boonville, Mo.....Term expires 1925
REID HUNT, Boston, Mass.....Term expires 1926
L. D. HAVENHILL, Lawrence, Mass.....Term expires 1927
L. F. KEBLER, *Chairman*, Washington, D. C.....Term expires 1928

WEIGHTS AND MEASURES.

JEANNOT HOSTMANN, *Chairman*...New York, N. Y.
H. V. ARNY.....New York, N. Y.
H. P. HYNSON.....Baltimore, Md.
C. M. SNOW.....Chicago, Ill.
E. F. COOK.....Philadelphia, Pa.

WILLIAM PROCTER, JR., MEMORIAL FUND.

J. F. HANCOCK, *Chairman*.....Baltimore, Md.
A. R. L. DOHME.....Baltimore, Md.
B. T. FAIRCHILD.....New York, N. Y.
CASWELL A. MAYO.....New York, N. Y.
E. G. EBERLE.....Philadelphia, Pa.
J. L. LENGFELD.....San Francisco, Calif.
C. M. FORD.....Cambridge, Mass.
CLEMENT B. LOWE.....Vineland, N. J.
WILLIAM B. DAY.....Chicago, Ill.
F. G. RYAN.....Detroit, Mich.
PARKER COOK.....Baltimore, Md.
J. K. LILLY.....Indianapolis, Ind.
H. S. WELLCOME.....London, Eng.
CHAS. G. MERRELL.....Cincinnati, Ohio.
JOSE P. ALACAN.....Havana, Cuba.
E. L. PATCH.....Stoneham, Mass.
LEWIS C. HOPP.....Cleveland, Ohio.
JAMES E. HANCOCK.....Baltimore, Md.
W. S. RICHARDSON.....Washington, D. C.

TIME AND PLACE OF NEXT MEETING.

THEODORE J. BRADLEY, *Chairman*...Boston, Mass.
J. O. BURGE.....Nashville, Tenn.
W. F. RUDD.....Richmond, Va.
F. W. NITARDY.....Brooklyn, N. Y.
E. SPEASE.....Cleveland, Ohio.

BOARD OF CANVASSERS FOR 1919.

F. P. STROUP, *Chairman*.....Philadelphia, Pa.
IVOR GRIFFITH.....Philadelphia, Pa.
W. W. MCNEARY.....Philadelphia, Pa.
E. E. HESSLER.....Philadelphia, Pa.
A. HUNSBERGER.....Philadelphia, Pa.
W. A. PEARSON.....Philadelphia, Pa.

CLOSER AFFILIATION OF PHARMACISTS AND PHYSICIANS.

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W. B. DAY.....Chicago, Ill.
CHARLES HOLZHAUER.....Newark, N. J.
I. A. BECKER.....Chicago, Ill.
H. A. B. DUNNING.....Baltimore, Md.

LOCAL BRANCHES.

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G. C. DIEKMAN.....New York, N. Y.
L. SAALBACH.....Pittsburgh, Pa.
C. W. JOHNSON.....Seattle, Wash.
E. S. THACHER.....Milwaukee, Wis.
F. E. BIBBINS.....Indianapolis, Ind.
R. W. TERRY.....Groveport, Ohio.

MODEL PHARMACY LAW.

F. H. FREERICKS, *Chairman*.....Cincinnati, Ohio.
W. C. ANDERSON.....Brooklyn, N. Y.
G. M. BERINGER.....Camden, N. J.
F. E. STEWART.....Philadelphia, Pa.
J. H. BEAL.....Urbana, Ill.

SPECIAL COMMITTEES.

AMERICAN JOINT, ON HORTICULTURAL NOMENCLATURE.

H. H. RUSBY, *Chairman*.....Newark, N. J.
O. A. FARWELL.....Detroit, Mich.
H. W. YOUNGKEN.....Philadelphia, Pa.

FEDERATION OF PHARMACY AND DRUG ASSOCIATIONS AND HOUSE OF DELEGATES.

H. V. ARNY, *Chairman*.....New York, N. Y.
C. E. CASPARI.....St. Louis, Mo.
C. O. BIGELOW.....New York, N. Y.
J. H. BEAL.....Urbana, Ill.
C. T. P. FENNEL.....Cincinnati, O.
A. R. L. DOHME.....Baltimore, Md.
S. C. HENRY.....Chicago, Ill.
W. B. DAY.....Chicago, Ill.
C. M. KLINE.....Philadelphia, Pa.
F. J. WULLING.....Minneapolis, Minn.

COMMITTEES APPOINTED BY THE SECTIONS.

EBERT PRIZE (APPOINTED BY SCIENTIFIC SECTION).

F. R. ELDRED, *Chairman*.....Indianapolis, Ind.
W. L. SCOVILLE.....Detroit, Mich.
W. F. RUDD.....Richmond, Va.

QUALITY OF MEDICINAL PRODUCTS (APPOINTED BY SCIENTIFIC SECTION).

E. L. PATCH, *Chairman*.....Stoneham, Mass.
H. ENGELHARDT.....Baltimore, Md.
O. A. FARWELL.....Detroit, Mich.
H. L. SCHULTZ.....New York, N. Y.

SPECIAL SUBCOMMITTEES.

BOARDS OF PHARMACY.

H. LIONEL MEREDITH, *Chairman*..Hagerstown, Md.
H. C. CHRISTENSEN.....Chicago, Ill.
E. BERGER.....Tampa, Fla.
A. THURSTON.....Columbus, Ohio.
R. H. WALKER.....Gonzales, Texas.

PHARMACISTS IN GOVERNMENT SERVICE.

A. M. ROEHRIG, *Chairman*.....Savannah, Ga.
A. F. DUMEZ.....Washington, D. C.
A. M. THOMAS.....Blaine, Wash.

FOOD AND DRUG CHEMISTS.

L. F. KEBLER, *Chairman*.....Washington, D. C.
L. A. BROWN.....New York, N. Y.
H. C. FULLER.....Washington, D. C.
CHARLES E. CASPARI.....St. Louis, Mo.
THEO. WETTERSTROEM.....Cincinnati, Ohio.

WHOLESALE DRUGGISTS AND MANUFACTURERS.

A. R. L. DOHME, *Chairman*.....Baltimore, Md.
CHAS. J. LYNN.....Indianapolis, Ind.
W. T. HOVER.....Denver, Colo.
H. K. MULFORD.....Philadelphia, Pa.
F. G. RYAN.....Detroit, Mich.

FACULTIES OF PHARMACY SCHOOLS.

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IVOR GRIFFITH.....Philadelphia, Pa.
HUGO SCHAEFER.....New York, N. Y.
E. SPEASE.....Cleveland, Ohio.
C. W. JOHNSON.....Seattle, Wash.

DELEGATES.

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

J. W. MORRISON, *Chairman*.....Chicago, Ill.
R. H. WALKER.....Gonzales, Texas.
F. E. HOLLIDAY.....New York, N. Y.
P. ASHER.....New Orleans, La.
A. W. MILLER.....Philadelphia, Pa.

NATIONAL DRUG TRADE CONFERENCE.

J. H. BEAL, *Chairman*.....Urbana, Ill.
J. C. WALLACE.....New Castle, Pa.
S. L. HILTON.....Washington, D. C.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS.

H. P. HYNSON, *Chairman*.....Baltimore, Md.
E. H. THIESSING.....Cincinnati, Ohio.
J. W. GAYLE.....Frankfort, Ky.
H. S. NOEL.....Indianapolis, Ind.
WILHELM BODEMANN.....Chicago, Ill.

AMERICAN MEDICAL ASSOCIATION.

B. FANTUS, *Chairman*.....Chicago, Ill.
REID HUNT.....Boston, Mass.
J. W. ENGLAND.....Philadelphia, Pa.
H. A. B. DUNNING.....Baltimore, Md.
F. I. LACKENBACH.....San Francisco, Calif.
J. H. BEAL.....Urbana, Ill.
J. L. LASCOFF.....New York, N. Y.
H. M. WHELPLEY.....St. Louis, Mo.
L. A. BROWN.....New York, N. Y.
J. F. ANDERSON.....New York, N. Y.

NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

H. C. CHRISTENSEN, *Chairman*.....Chicago, Ill.
L. E. SAYRE.....Lawrence, Kans.
L. L. WALTON.....Williamsport, Pa.

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G. M. BERINGER, *Chairman*.....Camden, N. J.
J. URI LLOYD.....Cincinnati, Ohio.
JACOB REHFUSS.....New York, N. Y.

GENERAL MEMBERSHIP COMMITTEES.

Chairman—WILLIAM B. DAY.....701 So. Wood St., Chicago, Ill.

District No. 1.—Chairman, JOHN G. GODDING, 278 Dartmouth Street, Boston, Mass. *Including* Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island.

Connecticut—CURTIS P. GLADDING, *Chairman*, Hartford.
THEODORE WEICKER, Stamford.
LEVI WILCOX, Waterbury.
Maine—M. L. PORTER, *Chairman*, Danforth.
ALFRED P. COOK, Portland.
JOHN COUGHLIN, Augusta.
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THE NEW YEAR.

The New Year comes clothed in mystery. But it comes with a great inheritance and holds great opportunities. The memories should give a determination to do great things in the thoughts of men, in their hearts, in their activities. The experiences of pharmacy should develop in pharmacists the resolve and purpose to shape it for doing greater and better service than ever before. A new year brings new hopes, new purposes, and it should be ennobled by high ambitions.

THE ADVISORY COMMITTEE OF THE A. PH. A. FOR SOLDIER AND SAILOR PHARMACISTS.

Every industry is looking after the welfare of its returning soldiers and sailors; the Committee above named is performing such work for pharmacists who have been and are still in the Service. This work is most important and druggists throughout the country will recognize their duty. The various drug journals have given splendid publicity. The time is now, and we feel assured that this is realized; it is a big undertaking and immediate funds are needed to activate this fine expression of patriotism, and an acknowledgment that druggists believe in the value of pharmacy—that they have an interest in those likewise engaged and who have given service to the country. See the report of progress of the Committee under Committee Reports and "do your bit." The members of the Committee are giving more than their time.

WAR HISTORY OF PHARMACY.

The War Department, Historical Department, Col. C. W. Weeks, Chief, and Major Frederic L. Paxson, Chief, Economical Section, Historical Branch, desires data relative to the activities of pharmacy and pharmacists in the War.

The Historical Section of the A. Ph. A. is desirous of compiling such data. The only way to obtain them is from those who actively participated. The Chairman of the Historical Section is Hugo Kantrowitz, 104 John Street, New York City; the Secretary is W. O. Richtmann, 1721 Van Hise Ave., Madison, Wis., and the Historian is E. G. Eberle, 253 Bourse Building, Philadelphia, Pa. The Chairman of the Membership Committees in their respective states are requested to collect such data and transmit them to the Historian. The contributions should be typewritten and in duplicate, double space between the lines and inscribed only on one side of the paper. The War Department desires brief authentic memoranda.

Whether these data are submitted to the War Department or not the American Pharmaceutical Association should have the records. All schools of pharmacy responded in one way or another to the call of the Government and records of the work accomplished should be preserved. Each school had alumni and non-graduates in the Service who should send in to these institutions data of pharmaceutical interest. An historical account of the participation of pharmacy in the war would have value, which to be complete requires coöperative work. This would entail considerable expense besides work of compilation, and the question arises as to whether it is worth the price.

SALE OF THE BAYER COMPANY.

The Bayer plant and stock was sold to the Sterling Products Company, of Wheeling, W. Va., and they in turn sold the dyestuff division to the Grasselli Chemical Company, of Cleveland, Ohio. The price of the purchase was over five million dollars, and the second sale involved nearly half of this amount.

SKIN DISEASES FROM LUBRICANTS USED BY METAL WORKERS.

The British Department of Scientific Research has investigated the cause of oil rashes. They are due to the plugging of the small glands at the roots of the hairs and to the mechanical injury to the skin by metallic particles suspended in the cutting lubricant. Washing on a liberal scale is a method of prevention and also the addition of antiseptics to the cutting lubricant.

TREATMENT OF VENEREAL DISEASES BY THE GOVERNMENT AND STATE.

Surgeon-General Rupert Blue, of the Public Health Service, has issued a ruling in regard to the mooted question of the cost of "606," in which trade interests have been embroiled, as follows:

In establishing clinics for the treatment of venereal diseases in the various cities of the country the question of furnishing free arsphenamine or salvarsan for the so-called "606" treatment is one that is causing some concern. When the Government furnishes this treatment free there are physicians who complain that the United States Public Health Service is practicing medicine in competition with them. On the other hand, it is said, there is the danger of pauperizing a certain class of patients by the loss of their self-respect and initiative. Surgeon-General Blue is sure of one thing, and that is that cost or no cost, the infected patients must be treated; not as a favor to them, but as a measure of public safety. He has directed that the question of charging for the necessary drugs be left to judgment of the State health officers.

THE AMERICAN PHARMACEUTICAL ASSOCIATION AND AMERICAN PHARMACISTS SHOULD TAKE A DEEPER INTEREST IN RESEARCH.

The editorial by H. V. Arny in the December number of the JOURNAL A. PH. A. should be re-read. A resolve should come into action that the importance of pharmacy will be measured by the research work of pharmacists. Among the addresses delivered before the New York Section of the American Chemical Society was one by Frank R. Eldred, which is re-printed in part:

"It is a rather disquieting thought that we know almost nothing about the mechanism of the action of medicines and that our present medicines have been developed by empirical methods. The effects of many drugs now widely used were discovered accidentally, while certain synthetic drugs were apparently developed for the purpose of utilizing a cheap by-product or a readily available intermediate, and still others were discovered by trying, more or less indiscriminately, one substance after another until one was found which had the desired action. Only a few of the many German synthetic drugs have proved to be of real value, while the larger number have been foisted upon the public by clever propaganda. It is not desirable that an institution should be established to foster this kind of research. Probably no one but a drug manufacturer knows how many remedies are proposed by chemists and others not chiefly occupied in the development or production of medicinal substances and therefore without any broad knowledge of the needs of medicine. No excuse can be found for many such proposals; some are based upon unsound reasoning and others are entirely lacking in originality, frequently to the extent of having been previously tried and discredited. It would only increase the number of drugs and at the same time lower their average efficacy if drugs inferior to those already available were placed upon the market. A research institute such as we are considering must not therefore lend its influence to the multiplication of drugs of doubtful value nor waste time in the investigation of many of the remedies which might be proposed.

"Although little is known in regard to the manner in which medicines produce their physiological effects, animal experimentation and clinical tests have yielded a great mass of facts in regard to the effects which are produced by various drugs and this forms the foundation of our present efforts in the development of remedial substances. Such facts are of course very important and must not be disregarded. As a result of such studies it has been possible to correlate molecular structure with physiological action in such a way that it has become a most valuable guide to the chemist working in this field, but when substances of such diverse constitution as cocaine, quinine, novocain, benzyl alcohol, and magnesium salts all act as local anesthetics, it becomes apparent that we must look more deeply for the cause of their physiological action.

"The problem is one for the physical chemist, and until the methods of physical chemistry are applied to the study of drugs and the actual mechanism of their action is investigated, we cannot hope for real progress in this most important field. Pharmacology, the study of the action of drugs, then becomes a study involving the application of recognized physical and chemical laws to the investigation of the reactions occurring between the living organism and the chemical agents employed. It is along such lines that an insti-

tute of pharmacology or therapo-chemistry should be developed rather than along the more superficial lines usually thought of in connection with pharmacological work. * * *"

ISOTONIC COEFFICIENTS.

William A. Knight, writing in a recent issue of the *Chemist and Druggist*, states that "dispensers are nowadays often asked to prepare solutions of different substances of such strength that they will have the same osmotic pressure. This can, of course, be done by determining the freezing point of the solution of one substance and then by a series of experiments making a solution of the second substance with the same freezing point, but this method requires extremely careful manipulation and takes considerable time. If the substances are non-ionizing, the calculation is simple, since molecular proportions of all such substances produce the same osmotic pressure, *e. g.*, if 360 of milk sugar have the same osmotic pressure as 180 of glucose, then two of milk sugar have the same osmotic pressure as one of glucose. With ionizing substances the calculation is complicated by the fact that a salt such as sodium chloride is partly dissociated into ions of Na and Cl, each of which exerts osmotic pressure, and the amount of ionization varies with the strength of the solution. It has, however, been shown that equi-molecular solutions of substances of the same chemical class (*e. g.*, potassium and sodium salts of monobasic acids) are isotonic, but these relations hold good only for members of the same class, and not of different classes. The isotonic coefficients, *i. e.*, the numbers expressing the relative osmotic pressures, exerted by molecular proportions of the different classes of compounds in dilute solution, are as follows:

Sugars	2
Potassium and sodium salts of monobasic acids	3
Potassium and sodium salts of dibasic acids	4
Potassium and sodium salts of tribasic acids	5
Alkaline earth salts of monobasic acids	4

"The calculation can also be made from the partial coefficients of the constituents, *i. e.*, every acid radicle, 2; every atom of alkali metal, 1; every atom of divalent metal, 0. If we now wish to make 4 fluidounces of a solution of glucose isotonic with normal saline (0.9 percent NaCl), we have:

Amount of NaCl in 4 fluidounces of 9% solution
$= 4 \times 0.9 \times 4.375^{*} = 15.75$ grains,
and 58.5 of NaCl : 180 of glucose : : 3 : 2,
or 2×58.5 NaCl $= 3 \times 180$ glucose,
or 1 of NaCl $= (3 \times 180) \div (2 \times 58.5)$ glucose,
or 15.75 NaCl $= (3 \times 180 \times 15.75) \div (2 \times 58.5 = 72.6)$
grains of glucose in 4 fluidounces of solution.

"Similarly, to calculate the strength of a solution of magnesium sulphate isotonic with sodium chloride, we have:

246.5 of magnesium sulphate : 58.5 of sodium chloride : : 2 : 3,
or 3×246.5 magnesium sulphate $= 2 \times 58.5$ sodium chloride;

for Mg = 0	and Na = 1
$SO_4 = 2$	Cl = 2
$\therefore MgSO_4 = 2$	$\therefore NaCl = 3$"

EGG SUBSTITUTES AND SO-CALLED EGG SAVERS.

The Pennsylvania Department of Agriculture has issued *Bulletin No. 314*, devoted to the class of preparations indicated by the title. More than forty of these preparations were investigated by Prof. C. H. LaWall, and in the introduction to his report he says:

"One of the most reprehensible ways of making money is to take some common, everyday substance, disguise or alter its appearance in some way, make a lot of exaggerated statements regarding it, and then sell it for about ten or fifteen times its market value, extolling it as an economical substitute for some expensive article. There has been no preparation of this class, within recent years, that has sprung into prominence with such rapidity as the so-called egg substitutes and with so little merit of legitimate warrant for their manufacture and sale."

The following are his conclusions, and Commissioner James Foust concurs by declaring the sales of such substitutes in violation of the Pennsylvania Food Act:

"First. The brightest light of publicity should be shed on these products, and the heaviest weight of official authority should be invoked to discourage their manufacture and sale.

Second. They afford an opportunity for unpatriotic profiteering, combined with the development of the art of camouflage to the point of perfection.

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* It should be noted that the calculations are made for an imperial fluidounce.—EDITOR.

Third. Their names are deceptive; their composition in no wise resembles that of egg; the presence of color, in those where it is used, is a fraud, and the claims as to replacing value are either deliberate misstatements or ambiguous phrases.

Finally. Egg substitutes serve no purpose that cannot be served just as satisfactorily and much more cheaply by articles in daily use in every household."

SANITARY AND PROPHYLACTIC SERVICE IN BRAZIL.

On May 1 Brazil established a sanitary and prophylactic service to prevent the spread of malaria in the Republic. As the first step in this campaign provision has been made for supplying quinine of known purity at a minimum cost to the public. To accomplish this the President of Brazil has issued a decree creating an official quinine service.

By a second decree of the same date the Minister of Justice and Interior is authorized to organize medical commissions to begin a rural prophylactic service "for combating the destructive epidemics of the interior of Brazil."

NEW CHEMICAL AND DRUG MANUFACTURERS.

According to the *Journal of Commerce*, twenty companies for the manufacture and distribution of drugs, chemicals and dyes were organized during December, their aggregate authorized capitalization being $6,145,000.00. The names of the companies with capitalization of $50,000.00 and over which were incorporated in December are: Ambrine Laboratories, Inc., N. Y., $250,000; American Remedies Co., Del., $300,000; American Potash & Fertilizer Co., N. J., $600,000; Aspirin Co. of America, N. J., $125,000; Allen Pharmacal Co., N. J., $100,000; DuPont Chemical Co., Del., $3,600,000; H. & H. Medical Specialty Co., N. Y., $50,000; K. T. C. Chemical Corp., N. Y., $50,000; Kinsey Chemical Co., N. J., $100,000; Laboratory Products Co., N. Y., $250,000; Laxcarin Products Co., Del. (manufacturing and sale of medicines), $100,000; Nono Laboratories Co., W. Va., $100,000; The Panvar Co., Del., $100,000; Pacific Herb Products Co., Wash., $50,000; Pittsfield Chemical Co., Pa., $140,000; Spanish-American Druggists Corp., N. Y., $100,000; Standard Chemical Works, Pa., $100,000; Victory Drug & Chem. Corp., N. Y., $100,000; Washington Dye & Chem. Co., N. Y., $150,000.

THE AMERICAN METRIC ASSOCIATION.

The annual meeting of the American Metric Association was held in Baltimore during the last week of December. The following resolutions were adopted:

"*Resolved*, That the American Metric Association hereby requests the formation of local sections throughout the country."

"*Resolved*, That the American Metric Association hereby expresses its desire to cooperate more fully with those American industries and trades using and contemplating the use of metric weights and measures."

"*Resolved*, That the American Metric Association send greetings to the universities, colleges and other educational institutions and respectfully invite their coöperation in bringing in the general use of meters, liters and grams for the welfare of America."

United States Senator John F. Shafroth read Bill S5037, which he has introduced in Congress, and asked for a discussion on the subject. This bill is a step toward the general use of metric weights and measures, making exceptions where such seem to be advisable for special work.

The Bill was endorsed by the American Metric Association.

Secretary of Commerce Honorable William C. Redfield was the principal speaker at the "Metric Dinner," held on the evening of December 27th. After outlining his practical experience as a manufacturer for thirty years and his travels in other countries in the interests of his export trade, he voiced the conviction that the metric weights and measures should and would be adopted for general use in the United States. The Secretary of Commerce said in part: "I believe that the metric system offers a return to simplicity, offers an effectiveness of thought, offers more to little children in our schools, if you please, which we are not justified in withholding from them."

The following officers were elected for the year 1919:

President—George F. Kunz, New York.

First Vice-President—Wm. Jay Schiefflelin, New York.

Second Vice-President—Jesse M. Smith, New York.

Third Vice-President—David A. Molitor, Detroit.

Treasurer—Arthur P. Williams, New York.

Secretary—Howard Richards, Jr., New York.

THE PHARMACIST AND THE LAW.

THE EXAMINER OF INTERFERENCES OF THE U. S. PATENT OFFICE RECOMMENDS CANCELLATION OF THE WORD "ASPIRIN" AS A TRADE-MARK.

The decision of the Examiner of Interferences of the U. S. Patent Office, relative to the word "Aspirin," is evidently based on the opinion that the name of this product can no longer be considered a trade-mark. He holds that the respondent, the Farbenfabriken of Elberfeld Company, has not used the word "Aspirin" for the substance in question—"acetyl salicylic acid," as a trade-mark *within the meaning of the law*. An appeal may be taken to the Commissioner of Patents and finally to the Court of Appeals of the District of Columbia. Following the expiration of the patent on Aspirin (No. 644,077) February 27, 1917, the National Drug Trade Conference asked for a legal opinion from its attorneys as to whether or not the patentees, represented by the Bayer Company, Inc., could continue their monopoly through having registered the name "Aspirin" as a trade-mark. In their opinion "Aspirin" was a generic name of a preparation, and so, on the expiration of the patent, passed to the public along with the right to manufacture that preparation. A contrary opinion was given out by the attorneys for the Bayer Company, Inc.

There are a number of viewpoints that have legal bearing on the subject and were expressed in the opinion of the Examiner. The opinion recites that the company failed to maintain prior to 1915 the exact composition of the substance for which the trade-mark was granted. The Examiner's belief is that to the lay purchasing public, or ultimate consumer, the word "Aspirin" prior to 1915 had significance primarily, if not exclusively, as the name of the pharmaceutical substance disclosed in Patent No. 644,077, owned by the respondent. It is stated to be a point in law that when a trade-mark name is so commonly used that it becomes the name of the product it ceases to be a trade-mark.

The big question which seems about to be definitely answered is, "When the patent on a medicinal preparation expires does the right to call that preparation by its well-established name go to the public with the right to manufacture the preparation?"

THE WAR REVENUE BILL.

The War Revenue Bill will likely not become a law until the latter part of January. The Senate attached a large number of amendments and, at this writing, the bill has not been considered in conference.

The tax on distilled spirits adopted by the Senate was $2.20 a gallon if used for other than beverage purposes, instead of $4.40 as proposed by the House, and $6.40 a gallon instead of $8 when used for beverage purposes. On perfumes imported into the United States containing distilled spirits, in lieu of the internal revenue tax now levied, a tax of $1.10 per gallon must be paid under the Senate bill, instead of $3.30 under the House bill. The Senate fixed the tax on soft drinks at 10 percent of the price for which they are sold, instead of 20 percent in the House bill, and upon near beer, etc., at 15 percent of the price instead of 30 percent. The tax on mineral waters was reduced from 2 cents per gallon where the price is over 10 cents per gallon, to 5 percent of the price for which they are sold.

Other excise taxes in the House bill were considerably reduced, among them the tax on toilet soaps and powders from 10 to 3 percent; chewing gum from 6 to 3 percent.

The tax on perfumes, essences, extracts, toilet waters, etc., is made 1 cent for each 25 cents or fraction thereof of the amount paid for them, and the same tax is to be levied on patent medicines. These taxes become operative May 1, 1919. Provision is made, however, that these taxes shall not apply to the sale of medicinal preparations which are not advertised to the general lay public.

"ASPIRIN" MAKER SENTENCED.

Jose Kukay, owner of the Verandah Chemical Company which manufactured "aspirin tablets" in Brooklyn, was convicted December 30, before Magistrate Dodd of a violation of the Sanitary Code. He was sentenced to an indeterminate term of not more than three years in the penitentiary and a fine of $500.

Kukay's home and factory were at 28 Verandah Place. There he manufactured the tablets, which, upon analysis by the Department of Health, were found to consist principally of talcum instead of aspirin.—*Daily Press.*

NEW YORK DRUG REGISTRATION LAW FOR HABIT-FORMING DRUGS.

Under the new law enacted by the New York State Legislature, druggists and others

who deal in narcotics must file an application during this month for authority to deal in habit-forming drugs. This registration is for the balance of the New York State fiscal year, and requires no fee; thereafter, during the month of June in each year, dealers and dispensers are required to register with the Department, the fee being $1.00.

CHANGES OF ADDRESS.

All changes of address of members should be sent to the General Secretary promptly

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